American Bee Journal

Vol. 95 No. 5 MAY 1955

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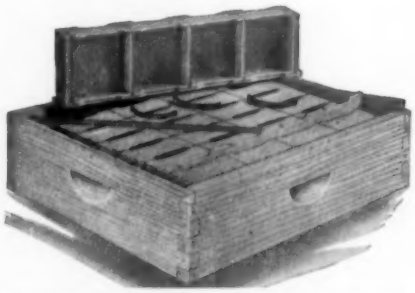

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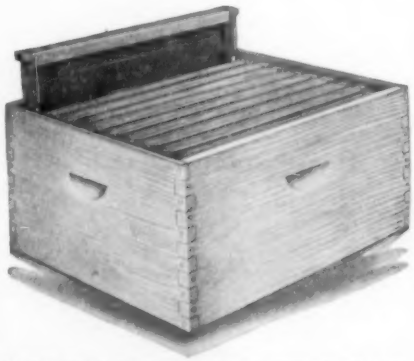

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Queens, 1 to 50, $1.00 each; 50 up, 90c
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THE AMERICAN BEE JOURNAL

HAMILTON, ILLINOIS

Vol. 95, No. 5 May, 1955

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Definitely, the PREFERRED stock of MAJOR SUCCESSFUL HONEY PRODUCERS the WORLD over. INSURE your crop with young, vigorous, producing, DEPENDABLE BERRY BEES. Sixty years of SELECT breeding.

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25-99	1.10	3.40	4.40	5.40	6.40
100-499	1.05	3.30	4.30	5.30	6.30
500-Up	1.00	3.25	4.25	5.25	6.25

— PRICES AFTER MAY 20th —

Quantity	Queens	2-lb. Pkg.	3-lb. Pkg.	4-lb. Pkg.	5-lb. Pkg.
1-24	$1.00	$2.75	$3.75	$4.75	$5.75
25-99	.90	2.65	3.65	4.65	5.65
100 up	.85	2.55	3.55	4.55	5.55

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QUANTITY	1-24	25-99	100 up
2-lb. Pkg.	$3.75	$3.50	$3.25
3-lb. Pkg.	4.75	4.50	4.25
4-lb. Pkg.	5.75	5.50	5.25
5-lb. Pkg.	6.75	6.50	6.25
Queens	1.25	1.15	1.05

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Above prices are for/or with our regular line Italians. For DADANT'S NEW IMPROVED STARLINES add 25c each additional. For TESTED QUEENS add $1.00 each additional. For QUEENLESS PACKAGES deduct $1.00 per package.

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100 Up	.65	2.75	3.35	4.00	4.65

Queens Postpaid-Airmailed and/or Clipped No Extra Cost

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Packages F.O.B. Shipping Point

THE STOVER APIARIES

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- **Prompt Shipment**
- **Low Prices**
- **Satisfaction Guaranteed**

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Write for Prices.
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The Picture Bee Magazine
Clarkson, Kentucky

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GARON'S OWN 3-BANDED ITALIAN STOCK — Improved through Know-How in selecting Breeding Queen Mothers for combinableness necessary for highest Honey Production.

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	Italians	Starlines	2-lbs.	3-lbs.	4-lbs.
1-24	$1.15	$1.50	$3.40	$4.35	$5.30
25-99	1.10	1.40	3.30	4.25	5.20
100-up	1.05	1.30	3.20	4.15	5.10

PRICES FROM MAY 26th:

	Italians	Starlines	—	2-lbs.	3-lbs.	4-lbs.
1-24	$1.05	$1.50	—	$3.20	$4.15	$5.10
25-99	1.00	1.40	—	3.10	4.05	5.00
100-up	.95	1.30	—	3.00	3.95	4.90

When Dadant Starline 4-Way Hybrid Queens are wanted with packages, add 25c extra per package.

Queens clipped and marked when desired, and Air Mailed at no extra cost.

GARON BEE CO. **Donaldsonville, La.**

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THREE-BANDED ITALIAN PACKAGE BEES AND QUEENS

Shipped Anywhere in United States and Canada

1955 Prices F.O.B. Hampton, S. C.	Queens (each)	2-lb. & queen	3-lb. & queen	4-lb. & queen	5-lb. & queen
1-24	$1.10	$3.50	$4.50	$5.50	$6.50
25-99	1.00	3.25	4.25	5.25	6.25
100 up	.95	3.00	4.00	5.00	6.00

(For queenless packages deduct price of queen)

Guaranteed safe arrival
Health Certificate with each shipment
Queens clipped and painted if desired
Shipper rated in Dun and Bradstreet

TERMS: One-third with order, balance 10 days before shipment.

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"The Push-Button Bee Smoker"

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- Highly Concentrated
- And Economical
- Gives Good Control

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Send for terms. Ship us your Beeswax. Prices are high.

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DADANT & SONS Hamilton, Ill.

Comments

LOUISIANA—We are battling against tremendous odds down here in the south, trying to recapture lost time due to unusual weather conditions. We have had two severe freezes (March 17) within ten days of each other and today (Monday) the temperature is only about forty degrees. Bees are in a tight cluster delaying matings and preventing laying. However, in spite of the weather, we are succeeding in meeting all the demands on us for bees and queens.—E. L. Garon, Donaldsonville.

CALIFORNIA—I hope you will keep trending the Journal to high type articles that not only beekeepers but anyone of high thinking will enjoy reading. The long article by Paddock (April—The Influence of the Honey Bee and Its Products on the Customs and Ceremonials of Man) is fine and outstanding. It should be made available to readers in public library reading rooms, to doctors and lawyers and it should be in all professional waiting rooms.—Troy Nance, Sacramento.

WISCONSIN—Commenting on Robert Mead's article on Carniolans ("The Sad Case of the Carniolans," Robert M. Mead, April) I certainly agree that northern beekeepers are missing a bet when they discarded the Carniolans without more extensive trials. For 35 years I worked with Italians but late years they became too cross to keep near highways so I turned to Caucasians and worked with them until I thought I had some pretty nice bees. Then, for a test, I got some Starlines and some Carniolans. Next spring I had visions of Carniolan swarms hanging all over the place. I was amazed to see how the Carniolans came through and the way they built up almost a month ahead of the flow. For production the Carniolans averaged 205 pounds; the Starlines 180 pounds; Caucasian and Caucasian hybrids, 170 pounds; and Italians 120 pounds. As for the swarming of the Carniolans, that is purely propaganda. All they need is management suited to their breeding habits.—Stephen Treakle, Holcombe.

In the opinion of some folks beekeeping is a lazy man's job as the bees do all the work. A year with the bees soon expels this idea. However there are short cuts and methods that really do lessen the labor of keeping bees.—Julius Lysne, Stockholm.

MINNESOTA—With reference to Dr. Jarvis' request that readers give their personal experience I offer mine. I have been a diabetic for about 17 years and I have been a commercial beekeeper for about 20 years. As far as diabetes is concerned my experience is that honey reacts about the same as sugar. Starches and sugars do the diabetic little good without insulin. It has been my habit during the years I have had the affliction to use insulin and enjoy honey the same as normal people do. I work as most other folks do. My boy and I produce about 50,000 lbs. honey a year. I recommend to anyone with diabetes to live as free from harmful habits as possible. I do not believe that tobacco or alcoholic beverage should have a part in a diabetic's life. If you must overstep the bounds of diet do it by eating a little honey. I have found it not too harmful and very enjoyable.—Chas. B. Miles, Glenwood.

"Bee Wise-Woodmanise Your Bee Supplies"

A. G. Woodman Co. (Send for catalog—350 Listings) **Grand Rapids 4, Mich.**

Choice

Honey Bees and Queens

DADANT'S STARLINE HYBRIDS and Wicht's Three-Band-Italians.

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406 Miller St. Hattiesburg, Miss.

"Quality, Service and Satisfaction"

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FOR 1955

Maximum production is most easily assured with superior bees and queens. That's one way we try to help you make money. Superior bees and queens is our motto at all times.

THE VICTOR APIARIES

Uvalde, Texas

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Canadian Bee Journal

Streetsville, Ontario, Canada

Dadant's for Honey Labels

"GULF BREEZE"

Italian Packages and Queens

Due to the late freezes and dry weather, bees and queens are scarce in the south. We have stimulated our colonies and will have many packages available during May. Our queen capacity is large and under the direct supervision of the owners. RUSH your orders to us NOW.

— PRICES —

Quantity	Queens	2-lb. Pkgs. W. Q.	3-lb. Pkgs. W. Q.	4-lb. Pkgs. W. Q.
1-24	.90	$3.50	$4.40	$5.40
25-99	.80	3.35	4.25	5.25
100-up	.75	3.25	4.15	5.15

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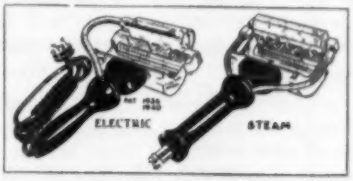
Donaldsonville, La.

YELLOW ITALIAN BEES AND QUEENS

As good as the best and are the gentlest of all. Priced so anyone can afford them. 2-lb. pkg. w/1955 queen, $2.50; 3-lb. pkg. w/1955 queen, $3.50; 4-lb. pkg. w/1955 queen, $4.30; Queens, airmail, 85c ea. Health certificate, live arrival guaranteed.

OSCAR ARNOUVILLE Box 203, Hamburg, La.



We are again able to offer the Rosedale Steam and Electric Uncapping Planes to the American Beekeepers. Write for Free Circular.

Price delivered, Electric Plane—$13.00, Steam Plane—$8.00

Satisfaction guaranteed. Full line of repairs on hand.

Write for Free circular of the Two-Queen Convertible Hive.

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Now is the time to have your Fumidil-B, Soy Flour, Brewers' Yeast, Terramycin and Sulfa on hand.

We are in constant market for beeswax and honey. Write us for shipping tags.

If you have equipment or bees for sale, contact us. We have buyers.

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Reports indicate little honey will be carried over into another season, and prices have advanced.

Now Is the Time.
Fill Every Hive in '55.

Order early for shipping dates of your choice.

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	1 to 25	26 or more
2-lb. pkg. with regular queen	$3.40 ea.	3.15 each
3-lb. pkg. with regular queen	4.40 ea.	4.15 each

For Island Hybrid Queen add 25c per package

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SULFATHIAZOLE—For American Foulbrood. In use for many years with good results. Standard preventive dose, ¼ tsp. in a ten-pound pail of sirup. Inexpensive.

2 ounces — 75 feedings	$ .96
8 ounces — 300 feedings	3.20
1 pound — 600 feedings	5.00
10 pounds—6000 feedings	42.75 Net, no discount

TERRAMYCIN TAF 25—For the prevention or treatment of European Foulbrood. TAF 25 is entirely soluble, economical. In sirup feed, one gram (¼ tsp.) to each feeding. For dry use, add powdered sugar to a ¼ tsp. to make a full teaspoonful. Mix thoroughly and dust on tops of brood frames. If disease is present use ½ tsp. of drug. Three treatments for either prevention or cure are usually enough. About 2½c per dose for prevention.

4-oz. bottle, 58 feedings, $3.20; 1-lb. bottle, 460 feedings, $11.90; 10 lbs., 4600 feedings, $73.60 Net, no discount

FUMIDIL-B—For Nosema. This serious disease of adult bees is often unnoticed. In packages may cause loss from supersedure that is serious. Likely cause of common spring dwindling. Colonies fed in fall or spring often make more honey. Packages do well without queen replacement and with little attention. Full directions for use on each bottle.

½ gram, 5 or 6 feedings, $2.40; 9½ grams, 100 to 120 feedings, $28.50; 57 grams, 600 to 700 feedings, $127.50 Net, no discount

DADANT & SONS, Inc.

Hamilton, Illinois

Lewis-Dadant Branches—Colonie and Montgomery Sts., Albany 1, N. Y.; Stephenson Ave. at 14th St., Lynchburg, Va.; 92 Riverside St., Chillicothe, Ohio; 1010 W. Austin St., Paris, Texas; Rt. 41, S., Hahira, Ga.

Dealers Everywhere

Abroad

Carniola

Janscha's Apiary . . .

British Bee Journal reports the house of Anton Janscha and its accompanying bee house still stands in the Carniolan country after more than 220 years from the time of Janscha's writings on bees. The bee-house is not in bad repair and possibly some of the hives still used date from Janscha's time.

England

Sherlock Holmes—Beekeeper . . .

British Bee Journal in one of its recent numbers states that the late Sir Arthur Conan Doyle apparently was well acquainted with bees and that Lady Doyle at least had bees at her residence in London. In one of Doyle's stories, Holmes remarks that "It is a wise man who keeps bees. You know where you are with them and at least they do not attempt to represent themselves as something they are not."

Tonsley Secretary of B.B.A. . . .

C. C. Tonsley, Editor of the British Bee Journal, is now also Secretary of the British Beekeepers' Association. We all wish him the best in what may be a difficult job. It is hard to get dues out of beekeepers. H. Malcolm Fraser.

France

Queens Atrophied—Produce Normal Ones? . . .

Commandant Eugene G. Eugene of the French Air Force has interested himself in "reflections on the Polymorphysms in Apis Mellifica." It is his contention that modern queens are atrophied in that they can neither gather honey nor pollen; nor can they feed themselves and they ignore all interest in the growing larvae, whereas solitary bees, closely related, perform all useful functions as well as laying the eggs for the colony. He argues, as a consequence, if we could get back to the all-purpose queen, we might have the perfect solution.

Fan Out the Bugs? . . .

"L'Abeille de France" (February 1955) describes a machine for gathering the insects which are detrimental to the growing and seed setting of rape, one of their principal early honey plants. The machine works mechanically, a combination of stirring up the insects and then suctioning them into the receptable for their ultimate destruction. Late seeding of the rape is advised so that the bloom is not yet on in full at the time of the worst infestation of the detrimental insects.

New Zealand

John McFadzien, Editor of the New Zealand Beekeeper, informs us of the death of Robert Stewart, one of the most notable men in the history of New Zealand beekeeping. He was New Zealand's foremost queen breeder and developed a strain of Italians with a high reputation in the Dominion and overseas. Born 84 years ago on Taieri Plain, he became interested in bees at an early age on his father's farm and rapidly gained in reputation until he provided the present high standard of commercial beekeeping in New Zealand. In 1947 he was made a life-member of the National Association in recognition of his services to the industry.

FLOWERS' QUALITY ITALIANS

That will stand the test for honey gatherers; gentle; prolific; queens bred from hives making 300-lbs. honey; guaranteed mated and laying; health certificate; full weight; prompt shipment; live delivery guaranteed. Ship by express, truck or parcel post. Include postage for parcel post shipments.

Packages With Young Laying Queens
Packages, Any Amount

2-lb. pkg.	$2.75
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TESTED QUEENS, $1.50 any amount

QUEENS,	1-24	25-100	101 up
Airmail	75c	75c	65c

OUR QUEEN OUTPUT IS DOUBLE FROM LAST YEAR, SO IF YOU WANT THEM AT ONCE, SEND US YOUR ORDERS.

For further information, write us.

FLOWERS BEE COMPANY
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The rearing of good Italian queens and bees is our only business.

45 Years' Experience

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2-lb. pkg. with qn.	$3.00	$3.35	$3.25
Queens	1.25	1.15	1.10

Add 90c per lb. for larger packages.

Young Laying Queens. Full Weight. Young Bees. Health Certificate with Each Shipment.

Prompt Service.

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FRAMESPACERS

The finest thing ever offered beekeepers. See your dealer or write.

STOLLER HONEY FARMS
Latty, Ohio

ITALIAN BEES and QUEENS

2-lbs. with queen	$2.75
3-lbs. with queen	3.50
4-lbs. with queen	4.25
Extra queens	.90

For Quality and Service try me.

Raymond McFarling
Shannon, Miss.

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Reg. U.S. Pat. Off.

Yes, we took a beating in the past weeks by the weatherman; but by dint of experience and resourcefulness we are slowly but surely regaining our equilibrium. If your order was delayed, please bear with us; we've done our best. Orders will be filled in sequence, without partiality, and with least possible delay consistently. Volume of orders booked with us is indicative of your faith in us and our products. We strive to merit your confidence.

Special Introductory Offer: On all orders for our "Magnolia State" Italian Queens we will substitute 10 Dadant "Starline" Hybrids (or 10% of order whichever is least) at the price of Magnolias. Please specify acceptance in your order. All Hybrids Clipped and Marked Free, others only on request. Fumidil-B fed to both cell-builders and mating nucs.

	"Starline" Hy. Queens	"Magnolia State" Italian Queens	Packages with Queens 2-Pound	3-Pound
1-24	$1.50	$1.25	$3.75	$4.75
25-99	1.40	1.15	3.50	4.50
100-up	1.30	1.05	3.25	4.25

For Starline Hybrid Queens in packages, add 25c to each.

JENSEN'S APIARIES **Macon, Miss., U.S.A.**

"The Business Quality Built."

Weaver's Caucasian Bees and Queens

OUR PRICES WITH NEW CAGES —

	Queens	2-lb. w/q	3-lb. w/q
1 to 9	$1.25	$3.50	$4.50
10 to 48	1.15	3.40	4.40
49 to 100	1.05	3.25	4.25

Prompt Shipment

Young Laying Queens—Full Weight—Young Bees. Health certificate with each order. Deduct 20 cents a package for bees in clean used cages.

Shipments made by express, parcel post, or your truck by prearrangement. For further information write us.

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ITALIAN PACKAGE BEES AND QUEENS

Quantity (packages)	2-lb. with Queen	3-lb. with Queen	4-lb. with Queen
1-24	$3.50 ea.	$4.50 ea.	$5.50 ea.
25-99	3.25	4.25	5.25
100 up	3.00	4.00	5.00
QUEENS: 1-24	$1.10	25 or more	$1.00

GOLD LEAF APIARIES **Box 252** **HAHIRA, GA.**

Three-Band Italian Package

BEES AND QUEENS

and Pure Italian Three-way D. R. Queens

Full weight, prompt shipment. Young bees. State health certificate with each shipment. Live arrival guaranteed.

We ship by mail or express.

1955 PRICES WITH YOUNG LAYING QUEENS

Lots of	2-lb.	3-lb.	4-lb.	5-lb.
1 to 29	$3.25	$4.00	$4.75	$5.50
30 to 100	3.00	3.75	4.50	5.25
100 up, each	2.80	3.50	4.25	5.00

Tested queens, $2.00 each **Untested queens, $1.00 each.**

For introduced queen add $1.00 per package. If queenless bees are wanted deduct $1.00 from the package price.

JACKSON APIARIES
Funston, Georgia, U.S.A.

Packing and Distributing Bulk Comb Honey

by Carl Kalthoff

AS a producer, packer and distributor of honey, the system adopted to facilitate all operations from taking off honey to selling probably is somewhat different from that of one who is a producer, packer or distributor of honey exclusively.

Our extracting and packing rooms are small so they may be heated easily in cool weather. They are mouse- and flyproof and are well lighted by many windows. Their size will accommodate the work of one day's operation, whether this is extracting or packing. Each room measures 7 by 14 feet.

On one side of the extracting room is the water-jacketed capping melter, the comb box with an opening in one end to drain the honey that drips from the uncapped combs, and the radial extractor. Extracting supers are placed on the other side. (See diagram) In the packing room two 1200-pound storage tanks are located at one end, connected with pipe to a honey pump. Above them is a water-jacketed warming pan. At one side, next to one of the storage tanks is located a smaller tank filled with water and containing three 60-foot, half-inch tinned copper coils. Next to it is a 1200-pound stainless steel packing tank, and then a table on which is placed a pan 2 feet long, 18 inches wide and 7 inches deep, holding a wooden slatted rack for cutting chunk honey. An opening in one end of the pan drains the honey that drips from the chunks as they are cut. The jars to receive the chunks are placed on the other end of the table. Chunk honey supers for one day's packing are stacked behind the person cutting. Cases of empty jars are within easy reach at the other side of the room. (See diagram) Jars are labeled before packing.

When we are ready to remove extracting supers, bee escapes are put on enough supers for one packing of honey. Combs are uncapped with an electric knife, then set in the extractor until it is full and while it runs more combs are uncapped and set in the comb box. From the extractor the honey is pumped into the warming pan located in the packing room and from there flows into the storage tanks. The warming pan contains a screen strainer to catch pieces of wax and so forth.

By about 5 o'clock on the afternoon of extracting, enough honey will be in the storage tanks to start the gas heater located under the tank of water to heat the copper coils. When the water reaches 165 degrees, the honey is pumped through the coils and is run through a Neises filter into the packing tank. The honey stands overnight in the tank, thus eliminating foam on top of the honey in jars. Next day we pack. We use three sizes of jars: the standard pint, the 2½-pound and the 5-pound square jar.

Combs are cut in nine pieces for pint jars, cutting from top to bottom; six pieces for 2½-pound jars, again cutting top to bottom; and

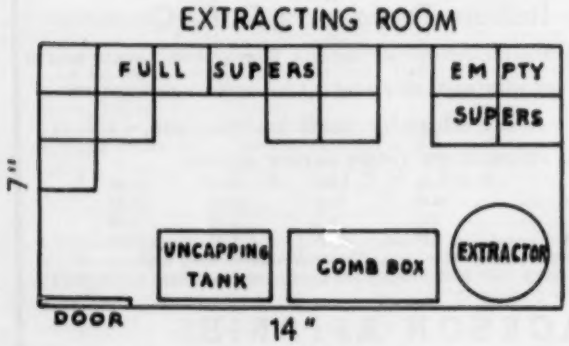


Diagram of Kalthoff's extracting room.

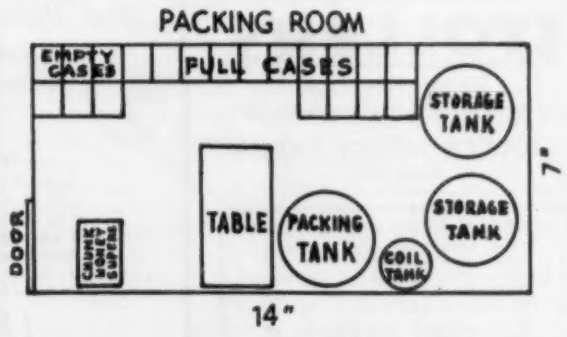


Diagram of packing room with arrangement for storage tanks, packing table and packing cases.

four square pieces for the 5-pound square jars.

The next two days are spent selling honey. It takes four days to get a batch of honey from the hives and on the store shelves. This procedure is continued until we have covered our four routes one time.

On extra days during this time, the balance of extracted honey on our hives is removed. Before extracting, cappings are melted and the wax run into open-top, 60-pound cans. We use a piece of baling wire with a block of wood attached to each end to remove the wax cakes from the cans. One block is set in the bottom of the can and the other is placed across the top of the can to hold the wire in the center. When the wax has hardened it is pulled from the can by the use of the blocks of wood and wire. The capping melter is heated by a gas stove. The honey is poured into 60-pound cans and used as bee feed.

To pack chunk honey properly, a warm room is necessary. During the early part of the season the weather is hot and honey in the packing tank is warm enough to pack from the heating the evening before. Combs cut well. When cooler weather arrives we need extra heat. Two thermostatically controlled electric heaters are turned on the evening before extracting and one set close to the stacked supers which are crisscrossed to facilitate warming the comb. Under the extractor are placed two 100-watt bulbs, boxed in to hold the heat, and turned on before starting to extract for the day. They burn all day so the honey will pump easily. When extracting is finished for the day, the heaters are moved into the packing room and one set close to the stack of chunk honey supers so the combs will cut well next day.

Chunk honey supers are placed crisscross with the first one set crosswise on a hive body. Water in the warming pan is heated by a two-burner electric plate. The honey in the packing tank is kept warm for the next day's packing with a 100-watt bulb boxed in under the tank and kept on during the night. Each honey pump has a 100-watt bulb boxed in over it to warm the pumps before pumping honey. Open-top, 60-pound cans catch the honey as it drains from the comb box and the capping melter in the extracting room and the chunk comb cutting pan in the packing room. Tin troughs are placed in storage tanks and packing tanks at inlets where honey enters the tanks. The honey flows down these troughs at an angle to the opposite side of the tank at the bottom.

In years of short crops we supplement by buying honey which sometimes must be blended. We fill the two storage tanks with different honeys and they are simultaneously pumped through the coils into the packing tank.

Successful marketing of chunk comb honey depends primarily on a consuming public, for chunk honey should move off the grocer's shelf within a certain time or it may granulate. Chunk honey packed in hot weather tends to granulate slower than that packed in cooler weather, even if the honey is packed at the same temperature. Some honey will granulate before it is sold. A total of 17 cases was picked up from the 1953 marketing season. This honey is liquefied in an electrically heated, thermostatically controlled pan of water and the jars come out as if freshly packed. All they need is a new label.

Chunk comb honey sells best during the early part of the marketing season. July, August, September and October are the high months. To realize the most from our crop, for both the merchant and ourselves, we keep our outlets well supplied during these months. About the middle of July, each route is covered one time during the first four weeks; after that each one is covered every five or six weeks, ending around the first of December and commencing again the middle of the next February, ending the latter part of April. We do not sell during December and January, January being a slow month. May and June are devoted exclusively to the production of honey.

We sell only one merchant in a town, as he will dispose of more honey than if we sold to all in a town. By selling only one in a town, and giving him the exclusive sale of our honey, we are able to sell him a good-sized order each time we call and spend just half the time in each town.

A little over 25 years ago we started to market our chunk honey in the standard pint jar. Today it is still the best seller. We have tried other styles besides the pint and the square jars and find them slow movers compared with the pint size. One point in its favor is that it can be reused. We use a small oval label, the same size on all jars. It covers only a small portion of the jar so that most of the comb is visible, for that is what sells the honey. The label identifies the honey and after a while people begin to ask for a certain label.

Service is a requisite in selling to the retail merchant, for that builds confidence. We guarantee the sale of honey, pick up any that shows signs of granulation, set up displays, clean and dust jars on shelves, and also price tag each jar if the merchant wishes. Advertising is a big thing today, but we have never spent a cent on direct advertising. One of our best media of advertising is our display of honey at the annual Missouri State Fair. Both the merchants who sell our honey and the people who buy it tell us how much they enjoy our honey displays.

Apiary Inspectors Approve Drugs for Prevention

Most of the apiary inspectors at the national meeting approved the use of sulfathiazole or terramycin to prevent American foulbrood. They were generally opposed to the use of these materials to cure infected colonies. A big exception to this was Minnesota. C. D. Floyd, Minnesota's chief apiary inspector, said that his inspectors will advise beekeepers on the proper methods of cleaning up American foulbrood with drugs in certain cases. The inspectors supervise the beekeepers. If the beekeeper fails to use the drugs properly and bring the disease under control, the colonies are destroyed. Mr. Floyd reports the plan has worked reasonably well.

The Canadian Inspection Service supplies the drugs to their beekeepers and gives advice on the proper use of different chemicals to control disease. (from Colorado B Notes, Vol. 5, No. 10).

Anise for Swarms . . .

To guard against possible swarming, an empty hive doctored with anise oil may be placed near the bees. Scouts, sent out before the swarm issues, are sure to choose this hive and the bees will thus hive themselves.

Julius Lysne, Wisconsin

How to Prevent Swarming*

by W. H. Purser

SWARMING is the natural means of propagation of honey bees. Swarms may issue at different seasons of the year, but more swarming is noted in the early spring than at any other time. If the old queen can fly she comes out and follows along with the first or prime swarm. Strong colonies of bees may swarm the second or third time within a week after the prime swarm issues and may have one or several virgin queens. If the old queen cannot fly a virgin will soon replace her after the swarm has possibly made several efforts to issue. If the queen is unable to travel with the swarm, the bees return to the hive from whence they came. It is not unusual for a colony to swarm in April and then swarm again in July in some sections of the state depending on the honeyflows.

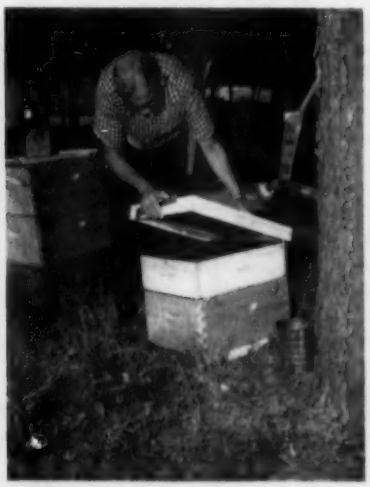
There is one principal cause of swarming and that is a crowded brood nest. Even a wet period of weather confining bees to the hive seems to cause a swarming fever. The brood nest may be confined to one or more frames. Any manipulation by the beekeeper that relieves the congestion within the brood nest will help to prevent swarming. One or two frames of honey in the center of the hive may constitute a barrier to the queen thus causing a crowded condition. Several methods of prevention are used by different beekeepers but very few are practical. The Demaree system is about the only sure-shot method of swarm control but it requires much manipulation. Mr. Demaree devised a plan of moving all the brood, except one frame of young brood, to the top of the hive and covering the queen and nine frames of combs and the frame of young brood with a queen excluder. Ten days later the cells above the queen excluder are removed. This method may be modified to suit the individual beekeeper. Removing one, two, or three frames of pollen, brood, or honey from the brood nest and replacing with empty combs or foundation may do the trick. These frames should be alternated with frames of brood. The filled combs removed should be freed of adult bees and given to a weak colony, set aside for stores, or extracted. If the queen is located, some of the adult bees can be left on the frames which will help the weak colony still more. Care should be taken not to give a weak colony more brood than it can care for. The weak colony should by all means have its entrances closed down to a very small opening to prevent robbing.

Swapping positions of strong and weak colonies is a very good practice for preventing swarming, especially in larger apiaries. This simply means setting the strong colony on the stand where the weak colony has been and then setting the weak colony on the stand where the strong one was. This should be done when many of the bees are in the field. Most of the bees will return to their former location thus equalizing the strength of the colonies.

Making early increase from extra strong colonies may be done without affecting the honey crop from the parent colony, and yet will help to prevent the colony from swarming. Simply remove three frames of honey and brood from the parent colony in the middle of the day and place them without bees in a new hive. Place the new hive on the old stand and give it a queen. Enough bees will return from the field to start a new colony.

* This article is also to be published as a research bulletin of Clemson Agricultural College, Clemson, South Carolina.

A three-story colony as it was overwintered.



This colony has been cut down to one story and given a super of foundation in an effort to produce chunk comb honey.

A frame of empty comb is being added to take care of the honey coming in at this period.

The problem of swarm control is greater when producing comb or chunk-comb honey. At least one-half of the hives in the apiary should have access to two full-depth hive bodies or more for several weeks before the main honeyflow begins. Figure 1 shows a three-story colony as it was overwintered just prior to being cut down to 1½ story and run for cut-comb honey. The other half of the hives should have had at least one hive body and one or two shallow supers. The stronger colonies should be selected for producing chunk-comb honey. When the colonies are strong enough (8 to 10 frames of brood) the two- or three-story colonies should be cut down to one story, Figure 2, and given a super of foundation. All the bees should be driven down into this one story and all the best frames of brood placed in this one story. The remaining equipment can be set on other colonies to be run for honey to be extracted or kept for winter stores, as in Figure 3. Empty combs should be placed on the hives for producing honey to be extracted. If the honeyflow lasts very long (longer than two weeks) it will be necessary to examine the brood nest in all colonies. Remove all solid frames of honey from the brood chamber and add empty combs in their place or frames of foundation may be used as in Figure 4. If the honeyflow is fast and only one super was given when the honeyflow began, another super should be given approximately every eight days here in the South. It may be necessary to add even the third super of foundation during one honeyflow before any honey is ready to take off, as in Figure 5. By all means another super should be added before the first one is fully capped. It is the usual practice to bottom super when producing chunk-comb honey. This is advisable because it prevents travel stains on the comb honey which will be produced. Supering can be overdone and the beekeeper find himself with little or no finished frames of honey.

Sometimes it will pay to change hives from producing comb honey to honey for extracting during the honeyflow and vice versa. This is easier to do than removing filled combs from the brood nest to prevent swarming. Using empty combs for honey to be extracted will help to eliminate congestion in the brood nest.

In our particular location here at Clemson, South Carolina, sourwood honey is within reach as the mountains are only twenty-five miles away. It seems that requeening in the spring and going to the mountains for sourwood with young queens helps prevent swarming. These queens should be in the hive at least by May 15. Spring-reared queens seem to last longer than fall-reared queens and often help to prevent supersedure during a honeyflow and possibly swarming.

Staggering the supers near the top of the hive, especially if the bees have full sun, gives needed ventilation and lessens the haul on bees bringing in honey. Some beekeepers think this also helps prevent swarming.

In the event swarm cells are found, something must be done immediately. First, determine if possible if the colony has already swarmed. Look for the old queen, noticing at the same time whether or not a virgin has emerged from a cell. If the old queen can be found the problem is simplified. Remove the old queen to a new location with part of the bees and brood for an increase, or kill her and make an increase with another queen or cell. All cells except one should be destroyed in the old hive, selecting one of the more mature cells to be used in the new increase. If no increase is desired, it would still be best to destroy the queen and leave a ripe queen cell to mother the colony. Seven days later go back into the colony and destroy any other queen cells started. If the old queen cannot be found the colony should be moved to a new location in the same yard. Take one of the queen cells and make an increase on the old stand. Remove all queen cells and if the old queen is still present she will very likely give up swarming. It is very difficult to keep a colony from swarming once it has ripe queen cells. Swarm cells may be differentiated from supersedure cells (cells for replacement of an old queen) by the number of cells in the colony. When the colony prepares to swarm they may rear as many as twenty-five or more cells. The colony that is superseding will seldom rear more than 6 or 8 cells.

Queen traps are of little value in controlling swarming. If you wish to make a colony really mean just try trapping the queen in the hive with a trap or queen excluder.

Spreading the brood nest and removing congestion by removing filled combs are the two major steps in swarm prevention.

These colonies are set to produce honey that will be extracted.

The honey in this hive is now ready to be taken off.

The 1955 Price Support Program

The U. S. Department of Agriculture announced on March 24, 1955 that extracted honey will be supported during the 1955 marketing season, which started April 1, at a national average of 9.9 cents a pound. This is 70 per cent of the current parity price adjusted to the 60-pound container level, and is 0.3 cents below the average support level of 1954.

The program for the 1955 crop is substantially the same as the one in effect last year. It provides for farm-storage loans and purchase agreements on U. S. Grade C or better extracted honey which is stored in 60-pound or larger containers in approved storage and is not objectionable in flavor. Beekeepers and cooperative associations of beekeepers can apply for loans or purchase agreements directly to the Agricultural Stabilization and Conservation (ASC) county offices.

For the states of Montana, Wyoming, Colorado, New Mexico and states west thereof, the support prices are as follows:

White and lighter table honey ..... 10.1 cents per lb.
Extra light amber table honey ..... 9.6 cents per lb.
Nontable and other table honey ..... 8.1 cents per lb.

For all states east of Montana, Wyoming, Colorado and New Mexico, the following support prices apply:

White and lighter table honey ..... 11.0 cents per lb.
Extra light amber table honey ..... 10.5 cents per lb.
Nontable and other table honey ..... 9.0 cents per lb.

The President and Secretary of The American Beekeeping Federation have forwarded protests on the reduced support prices to Secretary of Agriculture Benson. The Federation requested the same price levels as for last year, which was thought reasonable because there was no honey in Government hands and the Commodity Credit Corporation showed a small profit for the fiscal years 1953 and 1954. Others are urged to write their Representatives and Senators.

Beekeepers have from April 1, 1955 through December 31, 1955 to apply for loans or purchase agreements if they live in the states of

(Continued on page 192)

How to Control Bee Diseases

by G. H. Cale

THIS is the day of magic chemicals, wonder drugs, antibiotics—longer lives, fewer weeds, fewer pests, less disease. Honey bees come in for their share of attention. Maybe in a few years we will have attractants that will lure bees to flowers they now find of little interest, so they will work on them so eagerly that the farmer will have seed crops he never had before.

But now, this day, we have our own magic formulas,—sulfa for American foulbrood; terramycin for European foulbrood; and fumidil for Nosema.

Human nature is human nature, however, and most of us may be tempted to apply drugs and give up all our vigilance. Why bother to be so particular when our chemical friends can do all the prying for us? This attitude is a false one. Often, when we follow it, we in time discover that, somehow, bee disease is back with us, only now it is worse than it used to be. Outsmarting the treatments, the diseases bred a new race of drug eaters. They thrive on drugs, like DDT resistant house flies thrive on that spray.

Drugs are wonderful, no doubt about it. But we should keep our management tuned to disease just as we always have. Don't give up seasonal examinations, particularly for the brood diseases which are easy to see and diagnose. A good routine is one examination in spring; one when supers are given for the flow; and another as supers are removed during harvest. If either disease is found present at the end of the season, it is much safer to gas the bees and melt up the combs than it is to try to cure the disease, particularly when the disease is well distributed in the combs. If you perpetuate this sort of disease you may be building up real future trouble from virulence.

The most sensible way to use drugs is to fit their use into your management so they are employed on a preventive basis only. They are relatively inexpensive, certainly far less costly than losses from disease. No one knows how much loss occurs each year from Nosema which is hard to detect except in colonies with severe cases. It is not hard to find Nosema infected bees in spring in most colonies even though the colony population seems to be all right. Those who have used fumidil on overwintered colonies often report increased crops when they leave enough untreated colonies as a check. Late fall and early spring sirup feeding of fumidil is worth trying to see if you get equally satisfying returns. Colonies may be entrance fed with sirup even though they have a good supply of honey at the top.

As for packages, we know certainly, after using fumidil on hundreds of packages for two years, that it does kill out any Nosema and the bees live longer and queen supersedure is almost nil. It takes less cost to care for the package colonies. One feeding at introduction is enough. A 9.5 gram bottle is enough for 120 feedings.

For the prevention of both European and American both terramycin and sulfa can be used together in sirup or as a dust. We usually use sulfa if we have to feed sirup; a quarter teaspoonful of soluble sodium sulfathiazole to the feeding. So far we have only used the terramycin as a dust although there is a completely soluble form now obtainable for sirup. Terramycin is available as TM 5, TM 10, or TAF 25. We use the TAF 25 (soluble terramycin animal formula) at the rate of a quarter teaspoonful to the colony on a preventive basis (half teaspoonful on a cure basis) for EFB. When dust is used some rely solely on the terramycin for both brood diseases. I still cling to the idea that the combination is better so I use a fourth teaspoon of sulfa and a fourth teaspoon of terramycin with about a teaspoon of powdered sugar as an attractant.

When using the combination as a dust, try to give each overwintered colony at least two treatments before flow time about three weeks apart. When supers go on don't use any more. We don't want to risk drugs finding their way into the honey later to be packed and sold. If this happened we would be in real trouble with the food authorities.

The Nutritional Value of Honey

by

Dr. Mykola H. Haydak

Mykola Haydak was born in Ukraine. After completing high school he studied at the University of Kiev, Ukraine, the University and Polytechnic Institute of Prague and the Ukrainian Agricultural Academy in Podebrady, Czechoslovakia. In 1927 he received the American equivalent of his M.S. from the College of Agriculture and Forestry at the Polytechnic Institute at Prague. He worked for two and a half years at the state bee culture institute of Czechoslovakia, for five months in charge of the bee culture station there. Coming here in 1930, he studied under H. F. Wilson and Harry Steenbock on problems of bee nutrition. During the summers of 1930-1931 he worked at the U. S. Bee Culture Laboratory and in June 1933 received his Ph.D. at Wisconsin and since has been doing research and teaching at the University of Minnesota. Some of his most important honey work has been on role of honey in nutritional anemia, the vitamin content of honey, and honey in human nutrition. He has over 150 publications to his credit.

HONEY is the product of the work of the honey bee. It is the nectar and sugary exudation of plants gathered, modified and stored in combs by honey bees. Nectar contains about 40% of sugars, mostly sucrose (cane or beet sugar), the rest being water and a small amount of other materials. During the ripening process the water is evaporated and the main compound sugar of the nectar, sucrose, is changed by the action of enzymes into a mixture of two simple sugars —fructose (fruit sugar, levulose) and glucose (grape or corn sugar, dextrose). The average composition of honey as determined by Brown (1908), is as follows: water 17.7% (range 12.7-27%), glucose 34.0% (24.7-36.9%), fructose 40.5% (40.2-48.6%), sucrose 1.9% (0.0-10.1%) and ash 0.18% (0.03-0.9%), the rest being various materials such as acids, pollen grains, particles of wax, proteins, pigments, amino acids, aromatic compounds, higher alcohols, other sugars, dextrins, colloidal matter, enzymes, hormones, and vitamins.

Recent analyses by White and Maher (1954) showed that honeys contain also, on the average, 7.11% (4.48% to 18.3%) maltose and 1.03% (0.16% to 3.30%) of higher sugars.

Honeys produced from the nectar of flowers always contain more fructose than glucose and therefore they are, as a rule, levorotatory, that is, they divert the beam of polarized light to the left. The ratio of glucose to fructose varies according to the source of honey, being the lowest in honey produced from catsclaw (38.2÷40.8%) and sweet clover (36.8÷39.6%), and the highest in the apple (31.7÷42.0%) and tupelo (24.7÷48.6%) honeys.

As mentioned previously, honey contains acids, mostly malic and citric, while acetic, formic, succinic, and gluconic are present in smaller amounts. However, in spite of its acid reaction (pH 3.29 to 4.87), honey is a potentially alkaline food. This is because the acids of honey are mostly organic acids which break down completely into carbon dioxide and water when utilized in our bodies. The acidity or alkalinity of foods depends on the type of minerals they contain. If the food has a preponderance of "acid" minerals, such as chlorine, phosphorus, sulphur, then the food is potentially acid; if there are more alkaline minerals, such as calcium, magnesium, potassium or sodium then the food is potentially alkaline.

The average alkaline value of honey, as found by Lothrop, is equivalent to 1.5 cc. N alkali per 100 gm. honey (range from 0.2 to 4.6). It compares favorably with certain fruits and vegetables. The same investigator found that light honeys are more acid then dark ones, the potential alkalinity being 1.01 and 2.12, respectively. Organic acids metabolized in our body contribute to heat formation.

Minerals of honey are utilized by the living organism and thus contribute to the further increase of the value of honey as food. Gorbach and Windhaber, using spectrometric determinations found from 12 to 13 elements regularly present in floral honeys (K, Na, Cl, S, Ca, Mg, Fe, Mn, P, Si, Ni, Ba) with 13 others, (W, Ag, Zn, Ir, Pd, Al, V, Co, Cr, As, Sr, Ti) present in some honeys in small variable amounts. Mixed honeys and honeydew honeys contain 20 to 25 elements regularly. Recently, the presence of iodine was established in some honeys from the U.S.S.R. (20 to 26 micrograms per kilogram of dry weight).

Schuette and co-workers, while investigating the mineral content of honeys discovered that darker honeys are richer in minerals, particularly in iron, copper and manganese, than the light ones, the dark

honeys having, on the average, 9.4 parts per million of iron, 0.56 p.p.m. of copper, and 4.1 p.p.m. of manganese, while the light honeys had 2.4 p.p.m. of iron, 0.29 p.p.m. of copper and 0.3 p.p.m. of manganese.

It is a known fact that hemoglobin, the red pigment of our blood which carries oxygen to the tiniest portions of our organism, cannot be formed unless there is enough iron available for its formation. Besides iron, the presence of small amounts of copper is necessary in this process. Both these minerals are present in honeys and consequently honey should contribute to the build up of the blood hemoglobin. Very little experimental work has been done on this problem. Emrich in Europe selected six groups of children who were similar as to type, age, constitution, and hemoglobin content of blood and who came mostly from the same family or from families with similar living conditions. There were two children in each group of which one received honey and milk, the other milk only in addition to their normal diet. The results showed that those receiving honey had a greater increase in hemoglobin than those who did not receive this supplement. Rolleder, another European investigator, selected 29 pairs of boys, the individuals of each pair being as near as possible similar in weight, stature and the hemoglobin content of the blood. One boy of each pair received two tablespoonfuls of honey daily for six weeks in addition to the normal diet. The other boy did not (controls). At the end of a six-week period, there was a marked tendency for the blood of the boys who had honey in their diet to show an increase in hemoglobin content. Two-thirds of them showed an average increase of 8.5 per cent; two-thirds of the boys who did not have honey showed a marked fall in hemoglobin content of their blood. Presumably the remaining third in each case showed little change. A second test in which the controls were the experimental children and vice versa confirmed these results. In both cases there was no specification as to the kind of honey that was fed to the children.

Spöttel (1950) in his book on honey and dry milk gives some other examples of the beneficial influence of honey on hemoglobin formation.

Evaluating these data from European children is difficult because we cannot be sure of the state of nutrition of the individuals concerned. It is both obvious and known that an extra source of essential food factors is not necessary when the regular diet of an individual contains adequate amounts of all factors. Thus, there is no need for mineral pills for those persons whose normal diet contains foods with adequate amounts of each mineral. Minerals, however, are essential and if the normal rations do not contain adequate amounts then mineral pills are valuable and may protect the health of the individuals concerned. Honey contains no elements or compounds, as far as we know, which cannot be obtained adequately from other sources. However, when a person or animal has a diet which is more or less deficient in compounds occurring in honey, then obviously honey can be used to supplement the diet to supply these. This is well shown by experimentation.

In order to test the value of minerals of honey for hemoglobin formation, a series of controlled experiments was performed by Haydak, Palmer, and Tanquary at the Minnesota Agricultural Experiment Station. It has been found that if a young growing animal is placed on a diet consisting of milk alone it becomes anemic after a relatively short period of time because not enough iron is consumed with the food to maintain the normal formation of hemoglobin. This type of anemia is called nutritional anemia because it is a result of faulty nutrition. A three weeks old rat has about 11 grams of hemoglobin in every 100 cc. (cubic centimeters) of blood (one-third of an ounce of hemoglobin to three ounces of blood). In four to five weeks on a whole milk diet the amount of hemoglobin in the blood of such a rat decreases to five and even less grams in 100 cc. of blood. If iron and copper are fed with the milk, the hemoglobin does not fall but increases up to a certain level. If iron and copper are added to the milk fed to anemic rats—the amount of hemoglobin rises to the normal.

Haydak and co-workers used one hundred and sixty rats in the experiment. Because honeys differ in their iron and copper content, dark honeys being richer in those minerals, buckwheat honey, as a representative of the dark type and sweet clover and basswood honey as a representative of the light type were used.

Young rats were fed with whole milk to which 20 per cent of honey was added. Equivalent amounts of beet sugar (sucrose) were fed to the control rats. After ten weeks on such a diet, the hemoglobin of the blood of the rats fed dark honey increased from 10.8 grams to 11.4 grams, that of the rats fed light honey decreased from 10.6 to 4.6 grams and the sucrose-fed rats had hemoglobin levels as low as 3.6 grams per 100 cubic centimeters of blood. However, the rats offered a milk-dark honey mixture were consuming more food than those fed light honey and sucrose as an addition to their diet. In order to compare these diets in an exact way it was necessary to restrict each rat in the dark honey group to the amount consumed by the rats fed light honey or sucrose. After this was done the results were as follows: in 15 weeks the hemoglobin in the blood of the rats receiving dark honey supplement rose from 10.5 grams to 11.0 grams, that of the rats receiving light honey fell by the tenth week to about four grams per 100 cubic centimeters of blood and remained at that level to the end of the experiment. The hemoglobin content of the blood of the control animals receiving sucrose supplement fell steadily reaching the level of 2.9 grams per 100 cc. of blood.

When the hemoglobin content of the blood of young rats was reduced by a whole milk diet to a six or four grams level, the addition of 20 per cent dark honey to the milk diet caused a gradual increase in the hemoglobin level while the addition of 20 per cent light honey permitted a gradual further decline in the hemoglobin until a level of about three grams per 100 cc. was reached.

It was concluded that the dark honey can play a role in the prevention and cure of nutritional anemia in rats while light honey is less effective as a source of the blood-forming elements.

In estimating the nutritional value of various foods, the vitamin content is always taken into consideration. Up to the late thirties of this century the presence of vitamins in honey was controversial, most data pointing to the conclusion, that honey does not contain vitamins. With the improvement of the methods for a determination of vitamins, the problem was reinvestigated. In 1938-40, several European workers demonstrated the presence of substantial amounts of vitamin C in honeys which they investigated. However, the determinations made in 1942 by Haydak, Palmer, Tanquary and Vivino at the Minnesota

TABLE I
Vitamin content of territorial United States and foreign honeys (per 100 gm.). (Minnesota results)

Origin	Nectar source	Thiamine B^1	Riboflavin B^2	Ascorbic acid Vit. C.	Pyridoxine B^6	Pantothenic acid	Nicotinic acid (niacin)
U.S.A.		microgm.	microgm.	mg.	microgm.	microgm.	mg.
Washington	mixed	6.4	73	.6	300	87	0.78
Washington	clover and alfalfa	6.8	67	1.5	227	96	.24
Washington	black locust	7.4	68	1.4	233	100	.47
Washington	fireweed	8.2	81	4.1	397	56	.13
Oregon	locust	4.3	35	.5	260	103	.04
Oregon	alfalfa-sweet clover	4.3	36	1.3	430	175	.92
Oregon	fireweed	2.2	62	1.4	260	87	.84
Oregon	wild-buckwheat	4.3	56	2.8	250	180	.16
California (1941)	star thistle	8.6	137	6.5	410	90	.11
California (1941)	orange	8.6	35	2.5	210	150	.16
California	orange	4.3	42	1.9	310	63	.13
California	sage	3.0	36	5.4	320	56	.04
California	star thistle	3.0	58	1.3	420	58	.24
California	manzanita	7.1	..	2.5	280	..	.08
Texas	cotton	2.1	58	.6	350	103	.17
Texas	rattan	6.5	87	2.3	440	190	.23
Long Island	mixed	6.5	46	2.0	240	155	.26
Florida	tupelo (1934)	2.2	67	1.1	260	25	.24
Florida	tupelo (1940)	4.3	58	2.1	250	118	.44
New York	buckwheat	8.6	62	1.3	250	47	.13
Tennessee	poplar	6.5	..	1.2	240	..	.14
Tennessee	crimson clover	8.6	..	2.3	400	..	.56
Hawaii	algaroba	8.6	46	2.3	250	50	.32
Idaho	dandelion	6.4	87	2.5	267	192	.11
Montana	clover	3.3	77	3.2	416	141	.18
Montana	milkwort	9.1	..	2.9	250	..	.17
Minnesota	melon	7.1	36	2.6	400	156	.58
Minnesota	mixed (1934)	8.6	46	2.8	480	31	.86
Minnesota	mixed	7.1	53	3.6	260	25	.23
Minnesota	mixed (1940)	9.1	40	.8	470	103	.16
Minnesota	mixed (1941)	6.5	..	1.9	310	..	.11
Foreign							
Greece	unknown	8.6	47	2.8	460	58	.16
France	lavender	6.4	145	2.5	410	112	.82
Czechia	linden	9.1	62	2.5	240	56	.04
Azores	unknown	2.2	81	2.6	250	150	.33
Haiti	logwood	3.0	65	1.5	280	50	.15
Cuba	campanilla	2.2	58	1.3	420	56	.67
Guatemala	coffee plant	7.1	62	2.5	250	60	.94

TABLE 2

Comparison of aged and new honeys. (Wisconsin results)
All values are in micrograms per 100 gm.

		Riboflavin	Pantothenic acid	Nicotinic acid	Thiamine	Pyridoxine
Honeys of years 1935-1939	Mean	21.8±3.0	20.4±2.4	124.4±11.6	3.5±2.5	7.6±.66
	Range	9-64	9-60	63-600	1.4-6.2	9-14
Honeys of years 1940-1942	Mean	26.3±2.1	54.4±3.6	108.5±9.1	4.4±.50	10.0±1.1
	Range	7-60	20-360	72-590	2.2-12	4-27

Agricultural Experiment Station definitely proved that honeys contain variable amounts of a number of vitamins. The results of these determinations are present in Table I.

The honeys of the United States as well as foreign honeys, show wide variations in their vitamin content. Vitamin B^1 varied from 2.1 to 9.1 (av. 5.5) micrograms (one microgram=one-thousandth part of milligram); B^2 from 35 to 145 (av. 61.0) micrograms; B^6 from 210 to 480 (av. 299) micrograms; pantothenic acid from 25 to 192 (av. 105) micrograms, ascorbic acid from 0.5 to 6.5 (av. 2.4) milligrams, and niacin from 0.04 to 0.94 (av. .33) milligrams per 100 grams of honey. These variations are not surprising when one takes into account the differences in the origin of the honeys and the different conditions under which the plants were growing. In no case, however, was the ascorbic acid content of the foreign honeys as high as has been reported by several European investigators. The question of whether the geological or climatic differences played any role in the variability of the vitamin content of these honeys remains to be answered after a thorough study of the samples from the same sources but collected in different regions.

Kitzes, Schuette and Elvehjem at the Wisconsin Agricultural Experiment Station in 1943 also made analyses of various samples of honeys from a number of localities of the United States for their content of B vitamins. The values given by them for nicotinic acid and pyridoxine were considerably lower than those found by the Minnesota workers. (Table 2.)

This discrepancy can be explained by the fact that Kitzes and co-workers used microbiological methods for the determination of these vitamins while the Minnesota workers used chemical methods; or it may have been due to other causes, such as the origin of the honeys, the methods of extraction, etc.

The Wisconsin investigators also called attention to the fact that the content of pantothenic acid in honey diminishes with the age of honey. This destruction might be due to the fact that this vitamin is unstable in acid solution. Similar decrease in the pantothenic acid content with aging was observed by the Minnesota workers (see Table 1, Minnesota and Florida honeys of 1934 and 1940). Kitzes and co-workers also found small amounts of biotin and folic acid present in honey, the average values being 0.066 micrograms and 3 micrograms per 100 grams of honey, respectively.

All the natural honeys contain a certain amount of pollen grains and the type of honey can be determined by identifying the pollen. Normal honeys have a somewhat cloudy appearance. Some beekeepers, desiring to increase the attractiveness of honey, have sought a method for its clarification. Such a method has been devised by Lothrop and Paine. It consists of a thorough mixing of a small amount of rapidly filtering diatomaceous earth with honey, heating to 140--160° F. and filtering. Paine and Lothrop reported that such honey is free from turbidity, has a brilliant appearance, and retains all of the natural components of honey such as minerals, enzymes and flavoring substances.

In order to find out what influ-

ence, if any, such clarification has on the vitamin content of honey, Haydak and co-workers made an investigation of clarified and unclarified samples of honey obtained from the laboratory and from commercial sources. The results of their findings are presented in Table 3.

TABLE 3

Vitamin content per 100 gm. of clarified and unclarified honey.

Sample	Thiamine microgm.	Riboflavin microgm.	Pantothenic acid microgm.	Nicotinic acid microgm.	Ascorbic acid mg.
Commercial samples					
(a) Unclarified	5.1	80.0	100.0	400.0	2.1
(b) Clarified	3.6	62.0	92.0	290.0	1.9
Decrease %	30.0	22.5	8.0	27.5	9.5
(a) Unclarified	5.9	61.0	81.0	720.0	2.0
(b) Clarified	4.3	33.0	63.0	610.0	1.6
Decrease %	27.1	45.9	22.2	15.3	20.0
Laboratory process					
(a) Unclarified	8.4	93.0	176.0	870.0	2.7
(b) Clarified	5.4	64.0	97.0	460.0	1.9
Decrease %	35.7	31.2	44.9	47.1	29.6

From the table it is evident that there was a general decline in the concentration of vitamins due to the commercial clarification, although generally to a lesser degree than in the laboratory processed sample. The Wisconsin investigators also found that filtering honey through filter paper reduced the riboflavin content by 40 per cent and the nicotinic acid values by 25 per cent. It is now known that pollen contains considerable amounts of all the vitamins which have been shown to be present in honey. Therefore, the reduced vitamin content of the processed sample is no doubt partially the result of the removal of the pollen. Moreover, in the laboratory sample some of the vitamins actually dissolved in the honey probably were absorbed by the diatomaceous earth, decreasing the amount of vitamins still further.

The presence of vitamins in honey is important because when honey is eaten it supplies a part of the vitamins necessary for the metabolism of sugars absorbed from the honey, while when purified sugars are ingested the vitamins for their utilization must be drawn from another source.

Vivino and co-workers at the Minnesota Agricultural Experiment Station also carried on a series of investigations to determine whether vitamin K is present in honey. This vitamin is concerned with the blood coagulation. Blood of many animals which consume a diet low in vitamin K fails to coagulate and a small wound may cause a considerable loss of blood or even death. Although vitamin K is necessary for humans, a deficiency of this vitamin is not likely to occur under normal conditions. So far as it is known, vitamin K does not have anything to do with hemophilia which is a hereditary disease.

While working on the role of honey in the prevention and cure of nutritional anemia in rats, Haydak was impressed by the fact that the coagulability of the blood in the rats receiving honey supplement was so high that it was sometimes extremely difficult to draw samples for the hemoglobin determination. The natural antihemorrhagic vitamins K are fat-soluble substances. However, there are water-soluble substances which influence the clotting of blood. Therefore, it was considered advisable to test honey for the presence of factors influencing the coagulability of blood.

One hundred thirty-two hatched chicks were used for this experiment. They were fed vitamin K-deficient rations for a certain period of time. Their blood lost the ability to clot and some of the chicks which bruised themselves even bled to death. Then honey was added to the ration of the deficient chicks and the blood-clotting time was observed. The investigation showed that buckwheat, alfalfa and mixed honey when added to the deficient ration fed to sixty vitamin K-depleted chicks, restored the ability of the blood to clot and thus the presence of vitamin K in such honey has been established, (equal to approximately 0.25 micrograms of 2-methyl-1, 4 naphthoquinone per gram of honey). Commercial clarification does not reduce the antihemorrhagic activity of the clarified honeys compared with the unclarified controls.

As has been pointed out previously, honey contains more fructose than glucose. Because fructose is sweeter than sucrose or glucose (if we accept the sweetness of sucrose as 100, then the sweetness of fructose is 175 and that of glucose 74) honey, as a rule, tastes sweeter than ordinary sugar in the same dilution. Because of its high sugar content (about 77%) honey has high caloric (heat producing) value. It is primarily an energy food. The sugars of honey are predominantly simple sugars. Since simple sugars are quickly absorbed from the intestine, they serve as a readily available source of fuel for muscular and other activities. Actually, honey is used for such purposes by some athletes, deep sea divers, mountain climbers and in some other professions requiring quick replenishment of sugars depleted as a result of exhausting activity.

A small amount of dextrin and other sugars (maltose and melizitose, etc.) in honey also contribute to the caloric value of honey.

Clinical experiences and physiological experiments at the University of Munich and others had indicated that honey can be used not only as a dietetically important food, but that it contains components acting beneficially directly upon the heart muscle. It was, therefore, suggested that honey should be used by old people and especially in all those cases in which the work of the heart is increased, as in the case of sportsmen and of persons employed at heavy physical work. In this connection it is of interest to note the experiences at the Canadian Sports College where honey is used regularly with great success for replenishing energy after exhausting exercises.

Cases in which intravenous feeding of operated or weakened persons was indicated, a number of physicians at the clinics of the Universities of Marburg, Munich and others used a commercial specially treated, sterilized 20 per cent or 40 per cent honey solution with very satisfactory results and without any of the unpleasant manifestations which sometimes occurred when pure glucose was used for such a purpose.

In Europe, honey is used as a carrier for a considerable number of drugs since it is believed to facilitate absorption of the latter.

In many diseased conditions of the digestive system, a patient is confined to a liquid diet which con-

sists for the most part of milk often supplemented with cream. It was thought that by adding honey to milk the taste as well as the nutritive value of the diet would be greatly increased (Table 4). To test this assumption, Haydak at the Minnesota Experiment Station in 1935 subsisted for three months on a cow's milk-honey mixture consisting of 100 grams (3 tablespoonfuls) of honey per quart of milk. He found that his ability to work was normal and that no sluggish or tired feeling developed. The clinical observations were limited but showed maintenance of weight, normal bowel movements, absence of protein or sugar in urine, and a slight rise in the hemoglobin content of the blood. However, toward the end of the experiment, certain symptoms suggestive of vitamin C deficiency were noticed, consisting of fresh blood in the feces, dryness of the skin, a hyperemic area on the gums, numbness and ulceration of the tongue and small reddish papulae on the forehead and face. All these symptoms were promptly cured by adding orange juice to the diet.

TABLE 4
Composition of Milk and Honey. Amounts per 100 cc. or gm.

	Milk	Honey	
		Light	Dark
Calories	69.	320.	320.
Protein, gm.	3.5		
Ca, mg.	120.		
P, mg.	93.		
Cu, mg.	.015	.030	.11
Fe, mg.	.24	.24	1.28
Mg, mg.	12.		
Mn, mg.	.004	.03	.41
Thiamine, microgm.	50.	5.5	5.5
Riboflavin, microgm.	190.	61.	61.
Ascorbic acid, mg.	2.	2.4	2.4
Nicotinic acid, mg.	.21	.36	.36
Pantothenic acid, microgm.	.40	105.	105.

Later the experiment was repeated using five adults varying in age from 22 to 44 years, who were put on the diet consisting of a mixture of one quart of pasteurized milk with 100 grams of light honey. A mixed honey (from sweet and white clover) from the University apiary was used throughout the experiment. The diet was carefully prepared daily, bottled and distributed to all the experimental subjects. Because pasteurized milk is low in ascorbic acid (vitamin C) and is only a moderately good source of thiamine, (vitamin B^1) a solution containing 65 mg. ascorbic acid and 1 mg. thiamine chloride was added daily to the diet of each individual as well as one drop of 10 per cent solution of potassium iodide. There were two control and two test periods for each subject. These were alternated and lasted for about four weeks. During the control periods the subjects ate their normal customary diet. No attempt was made to record the diet during the control periods.

The persons using the diet maintained their normal activities. At the end of the experiment they were in normal health and no bad effects were observed, except that in the case of some subjects the dose of vitamin C had to be increased because the symptoms of scurvy appeared. Therefore, milk and honey mixture, properly supplemented with vitamins, can be used in human dietaries.

Experiences at the University clinics at Leipzig, Berlin, and Halle showed that feeding dry milk-honey combination (they used a commercial "Ho-Mi" product, consisting of 65 per cent dry skim or whole milk solids, 25 per cent honey and 10 per cent glucose) was very beneficial in cases of complete loss of appetite, serious diseases of the digestive tract, alimentary dystrophy, undernutrition, postoperative loss of proteins, in convalescence, in cases of complete exhaustion, and in the diet of heart patients.

Of course, the largest consumers of the sweetened milk diets are infants. There is an abundance of articles published in various bee journals about feeding honey as a substitute for other carbohydrates in milk formulas for babies, describing very favorable results. According to the late Professor Schlutz, and his co-workers, "To be of value to the infant, a carbohydrate must be so well tolerated that it will not cause digestive disturbances, must be easily absorbed from the digestive tract and must be readily utilized by the body tissues."

In order to compare the value of various carbohydrates (sugar-like substances) in infant feeding, Doctors Schlutz, Knott and co-workers (1938) of the Department of Pediatrics at the University of Chicago, employed honey along with other sugars in their experiments. Two groups of children were used to determine the effect of various sugars: four children from 7 to 13 years of age, and nine infants ranging from 2 to 6 months. The investigators fed the children diluted sugars, then took blood samples and determined the sugar content of blood in 15 minutes after the meal, 30 minutes, 60 minutes, 90 minutes and 120 minutes. When sugars are absorbed from the intestines, they enter the blood stream and are carried to the liver to form glycogen. If carbohydrates are eaten above the limits of the liver to store it as glycogen, the excess is transformed in the tissues to fat and stored as such. Very interesting results were obtained with honey. During the first fifteen minutes honey was absorbed the most quickly of all the sugars tested, with the exception of glucose. However, honey did not flood the blood stream with an over-abundance of sugar. It also maintained both a steady and a slow decrease in blood sugar until the initial level was again reached.

This response of honey is presumably due to the unique combination of the two easily absorbable sugars, glucose (dextrose) and fructose (levulose). Honey is quickly taken into the body because of its dextrose content, while the levulose, being somewhat more slowly absorbed, is able to maintain the blood sugar level. Honey has an advantage over sugars which contain higher levels of glucose since it does not cause the blood sugar to rise to higher levels than can be easily cared for by the body. The investigators concluded: "With its easy and widespread availability, palatibility and digestibility, honey would seem to be a form of carbohydrate which should have wider use in infant feeding."

Because of these findings, Schlutz and Knott (1938) began to study the possibility of using honey as a sweetening agent in infant feeding. The remark at the beginning of the report on this work is worth mentioning. The authors stated: "Although honey has been known as a food from the earliest days of which we have historical records, its importance to man seems to have decreased as civilization advanced. In view of the fact that honey is a product . . . ready for use without artificial treatment and that it is composed of two sugars most ac-

ceptable to the organism, it is strange that honey has not enjoyed wider use, especially in the feeding of infants and children."

In their experiment the authors studied the influence of the addition of honey to the diet of ten healthy infants during the first six months of their lives for a total of 151 weeks. The response of infants to honey as a source of sweetening has been contrasted with their response when receiving corn syrup. The general well-being of the infants, the number of stools per day, and weight gains have been used to determine the value of honey in regular feedings.

From these studies it was concluded that honey is easily digested, it is well tolerated by the infants and does not cause diarrhea. In cases of constipation the increase in the amount of honey in the diet relieved this condition by improving digestion without causing diarrhea. Honey may thus have a distinct advantage in infant feeding over those carbohydrates which have a tendency to be laxative. Honey may facilitate weight gains, since there was a slight tendency for greater average gains per day to occur when honey was included in the formulas.

The authors concluded: "It would seem, therefore, that honey is a type of carbohydrate which is well suited to the infant's needs and probably should be recommended for wider use in infant dietaries."

Everybody knows that besides proteins, carbohydrates, fats and vitamins a baby needs minerals for normal growth; calcium and phosphorus being required in the largest amounts. It is not enough to supply these minerals in food, it is important that the largest part of them be retained by the body for its own use.

In order to find out how much calcium is retained from the food by the infants, Knott, Shukers and Schlutz (1941) determined the calcium content of the food given the babies and then they established the amount of this mineral present in the feces and the urine eliminated by the experimental infants during the test period. The difference gave the amount retained by the body.

A total of 120 such test periods was completed on 14 infants. Various types of milk were used in the diet and the latter was more or less modified as to its vitamin D content. Honey as a source of carbohydrate was compared with corn syrup for different types of milk and for varying levels of vitamin D. The investigators noted that for all the periods studied the average retention of calcium was always higher if honey had been included in the formula. These increased retentions when honey was fed occurred both with low and with high intakes of vitamin D and occurred regardless of the type of milk fed or the use of lactic acid. These investigators concluded that in comparison with corn syrup honey would seem to have a definite beneficial influence upon the retention of calcium by young infants.

Magnesium is also an essential element in human nutrition. The major portion of the magnesium occurs in the skeleton where it is included in the proportion of approximately 2 or 2½ parts to 100 parts of calcium. Magnesium is considerably more abundant than calcium in the soft tissues where, among other functions, it is an activator of the phosphatase and glycolytic enzyme system and helps to prevent muscular and nervous irritability.

Doctors Shukers, Knott and Schlutz (1941) investigated the amount of magnesium utilized by the infants when honey and corn syrup were added to their milk diets. They found that "retentions of magnesium were slightly greater when honey was the source of added carbohydrate than when corn syrup was used for this purpose. With powdered half-skim milk furnishing the magnesium, thirty periods on honey averaged a total retention of 24 milligrams as compared to ten periods on corn syrup with an average retention of 16 milligrams a day. When evaporated lactic acid milk was fed, thirteen honey periods had a mean retention of six milligrams in contrast to a mean retention of -0.4 milligrams per day for 12 corn syrup periods."

The authors concluded: "Although the data are not conclusive, slightly better retentions were found when honey was the source of carbohydrate than were observed when corn syrup was added."

Vignec and Julia (1954) of the Pediatrics Department of the New York Foundling Hospital reported their experiments in feeding infants using honey formulas. The infants remained under observation until the fourth month of age or until their discharge, whichever came first. "A total of 387 infants were divided into three groups and offered isocaloric (the same caloric value) formulas reinforced with honey, Dextri-Maltose No. I, or Karo corn syrup."

"Honey-fed infants were superior to Karo-fed infants in respect to average weekly weight gains, linear growth, and hemoglobin values and compared favorably although they were not superior to Dextri-Maltose-fed infants. Within the first two weeks after the formulas were introduced 18 honey-fed infants and 19 Dextri-Maltose-fed infants developed nonspecific gastroenteritis. During a comparable period of time, 33 Karo-fed infants developed this condition."

"Feeding problems severe enough to cause discontinuation of the formula did not occur in the honey or Dextri-Maltose groups, but occurred in 15 instances in the Karo group. Most infants responded avidly to honey formulas and while they responded well to Dextri-Maltose formulas, their enthusiasm for the latter was not as great. Two cases of physiological anemia requiring therapy occurred in the honey-fed group, seven in the Dextri-Maltose group and eleven in the Karo group."

The investigators concluded: "It would seem from the observations in this study that honey has a definite place in infant feeding."

At the University Clinics at Berlin and Leipzig very beneficial results were obtained in feeding infants a honey-milk mixture ("Ho-Mi") in which dry whole milk was used.

Of course, in some instances, there is an aversion to honey. However, such cases are rather rare, and the simple solution in such instances is to avoid using honey in the diet entirely.

The amino acids of honey are present in too small amounts to be of real food value (maximum 0.0375 per cent; minimum 0.0008 per cent; average 0.00476 per cent). However, reacting with the sugars of honey, they contribute to the formation of dark pigments, "melanoidins," which cause darkening of honeys in storage. There are some other changes associated with age, probably in the flavor becoming considerably stronger, which is the result of an increase in the amount of aromatic substances. The latter play a very important part in imparting to honeys from various sources their particular flavors and thus making the honeys more appetizing food than ordinary sugar is.

Honey is a hygienic food since it has bactericidal (bacteria killing) properties. This is due partly to the fact that honey has an acid reaction

and bacteria do not thrive in acid media. Another cause is the high sugar content of honeys and the consequent hygroscopic property. Because of this property moisture is absorbed from bacteria, which causes their destruction. Recently a bacteria-killing substance, "inhibin," which is sensitive to heat and is destroyed by the sunlight was isolated from honeys.

Waugh and Waugh (1940) studied the effects of natural and refined sugars on the mouth bacteria (Lactobacilli) and caries development among primitive Eskimos. In most cases the feeding experiments lasted five to six weeks. They found that practically 100 per cent of those free from caries in the group fed natural sugars (raisins, dried figs, maple syrup, honey, dates) remained free from caries and showed a drop from the original percentage of bacteria. Of those who had carious teeth 57.16 per cent showed, on an average, an increase of 1.57 cavities per person (none in honey group) which might be considered a normal increase for actively carious mouths. From these figures it was concluded that with the Eskimo natural sugars do not initiate or cause an increase in the growth of oral bacteria; neither do natural sugars initiate or cause an increase in dental cavities.

Of those free from dental caries in the group fed refined sugars (preserved figs, candy bars, lollipops, sugar solution, sugar cubes) 72.23 per cent showed inception of caries, with an average of 3.6 cavities. Of those with carious mouths, 100 per cent showed an increase in the number of cavities, with an average increase of 4.9 cavities, which must be regarded as an increase far above normal for a five or six weeks' period. In the group fed refined sugar, 81.90 per cent showed initiation of the growth of oral bacteria and these organisms were present in 100 per cent of the mouths at the end of the feeding period. From these figures it was concluded that with Eskimos refined sugars cause an increase in the growth of mouth bacteria and also initiate and cause an increase in dental caries.

A small amount of yeast cells present in unheated honeys may, under certain conditions contribute to the spoilage of honey. Keeping honey at temperatures below 52 and above 75° would prevent or greatly reduce this possibility. Fermentation, of course, reduces the caloric value of honey and makes it less appetizing. However, heating honey to 145° F. and maintaining at this temperature for a half hour will destroy the yeast and make the honey fit for consumption.

To what an extent the enzymes, invertase, catalase, diastase, inulase and the dehydrases, which are probably of both plant and animal origin, add to the food value of honey is not known. However, they are present in such small amounts that their contribution to any digestive processes would be insignificant.

Several investigators, working with rats, reported the presence of an oestrus producing substance in honey. Very little is known on this subject, therefore it is difficult to estimate what influence, if any, it would have on the persons consuming honey.

In some parts of the world (Asia Minor, Caucasian Mountains, Japan, Scotland) and in various regions of the United States there are plants which secrete poisonous nectar. Honey made from such nectar is, of course, poisonous too. However, such honeys are so rare in their occurrence that they do not constitute any problem, except in some isolated localities.

Occasionally we find in the literature mention of bitter or salty honeys. They are of a very rare occurrence and their appearance is rather accidental.

Honey from the colonies killed by the use of calcium or potassium cyanide is found to be free of hydrocyanic acid, and therefore is safe to use as food.

If kept in metal containers, honey will take up some metals in solution. This uptake during extraction is insignificant, and therefore does not impair the food value of honey.

In some clinics honey is recommended for use in the levulose tolerance tests in preference to pure levulose.

In several instances honey has been reported to be fed to horses, cattle, and even fish with good results.

There is an increased interest in honey and bees at the present time. No doubt, the findings which have been made during recent years are just the beginning of researches on honey. With the increased realization of the importance of unrefined foods in human nutrition it is hoped that honey will take its deserved place among other foods in human dietaries.

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Home Grown Crosses

by G. Theodore Freihofer

ABOUT thirty-five years ago, when I used to hunt wild bees extensively every summer, hiving the best swarms and running them in conjunction with my regular colonies, I decided to carry on a series of experiments in crossing different races of honey bees in an endeavor to produce a variety, or type, that would have all the hardiness of the wild bees, a qualification which I had always admired, plus the further qualifying traits that my best stock combined, and that my exacting apicultural pursuits demanded.

In those days it was difficult to obtain good tested queen bees of certified stock, especially of different races, and at best, they were rather expensive. However, I finally succeeded in locating a couple of queen breeders in widely separated parts of the U. S. who had certified stock of the races of honey bees I needed in my experimental work, which were namely: Cyprian, Caucasian, Italian and Carniolan; and I ordered a tested queen of each race.

I had previously isolated four of my strongest wild colonies in a large clearing some five miles from the home apiary, and as the queens arrived I introduced them to my isolated wild "devils" and equipped each colony with an extra hive body containing 10 frames of old, dark brood combs, and as the weeks went by and the combs began to have an abundance of brood in all stages of development, I caged my queens to induce cell building, and prepared to use their progeny in my crossing experiments.

Artificial insemination of queen bees was not in general practice in those days as it is now, and so the "controlled" mating of my queens was accomplished by the use of a mating cage (or, more accurately, a mating **trap**), which I had invented a few years previous, and had used with very satisfactory results in the special matings of some of my prized stock.

Anyhow, as time went on, my experiments with hybridizations and hybrid crosses finally comprised a period covering a number of years, in which time I succeeded in producing some markedly different types of honey bees, a few of which had about all the traits and characteristics I had striven to attain, and were indeed very satisfactory bees in every respect. However, for the benefit of those of my beekeeper readers who might have a desire to experiment along these lines with the idea in mind of extending the accrual from their bees, I shall go so far as to say, that for the beekeeper who is running his apiary exclusively for the production of honey, there is no point of immediate advantage to be gained in crossing if the colony or colonies of bees he is contemplating changing over are good honey makers at the outset.

I say this primarily by reason of the great expenditure of time involved in developing certified new varieties. A beekeeper should always bear in mind, when contemplating changing his "breed" by crossing, that hybrid bees are not always **high bred** bees, for in crossing the different races, as with crossing different breeds of poultry or livestock, one is always taking a chance as to the eventual outcome. Every cross has to be "test proven" over a certain period of time; often involving years of painstaking selection and anxious waiting, regardless of how well planned or under what circumstances. One can be theoretically sure of an anticipated result, but not absolutely sure until there are many well beaten paths across a timeworn proving ground.

The logical aspect of the matter is, that to the honey producer, big or small, honey-making bees are money-making bees. So, r a t h e r aside from possibly requeening with well-known strains of queens carefully bred from honey-producing stock, I would staunchly advocate the building up of all good, retrieving colonies, regardless of race or hybridization, by selective breeding of local queens from year to year, in an effort to create a given strain of native bees that would, in the long run, prove to be far more valuable as honey-makers than any first few crosses of any two different races would ordinarily pan out to be; even though, as a result of crossing, they might be better shaped bees, have more refined markings, and be in many ways more beautiful to look at than any of the other bees in the apiary. In spite of all these lovely embellishments, they might not be good honey-makers and, therefore, not good money-makers either, as far as the practical beekeeper is concerned. As Les Berwick has so effectively said: "They c'n sugar-coat their fancy bees all they've a mind ter; but the bees thet put honey in t' th' beekeeper's hives, are the bees thet put bread 'n' butter in t' his wife's pantry!"

Phillips Beekeeping Library at Cornell

Dr. E. J. Dyce reports that the E. F. Phillips Beekeeping Library is now housed in the Mann Library of Cornell University at Ithaca, N. Y. All the old items previous to 1900 are kept in a fireproof vault inside a fireproof building. The library endowment fund is sufficient to afford the new literature as well as keep up binding and add valuable items as offered.

Price Support —

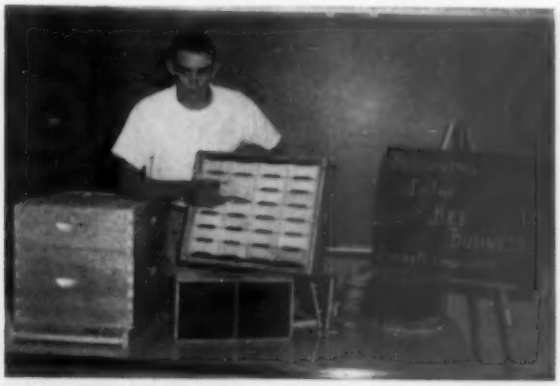
(Continued from page 184)

Florida, Georgia, South Carolina, Alabama, Mississippi, Texas, New Mexico, Arizona, and California. In all other states they have from July 1, 1955 through December 31.

Those interested in participating in the support program are urged to obtain detailed information concerning the program. This can be done by writing to the Sugar Division, Commodity Stabilization Service, U. S. Department of Agriculture, Washington 25, D. C.; to one of the regional commodity offices of the Commodity Stabilization Service; or from your county ASC office.

At the time of this writing no announcement has been made concerning the subsidy export and diversion programs.

In announcing the honey price support program, the Department again urged beekeepers to increase their efforts toward utilizing bees in pollination of important pasture, seed, vegetable, and fruit crops on a remunerative basis; and emphasized the importance of continued and intensified activity in improving the marketing and distribution of honey by all elements in the industry.



Bobby McLawhorn, New Bern, N. C., represented Craven County in one of the District 4-H Beekeeping Demonstration contests.

Clarence Chappell, Jr., Belvedere, N. C. State Winner in the Beekeeping Demonstration Contest at State College during 4-H Club Week, 1954. Also Winner in Field Crops in 1951 and Meat Animals 1950. In 1954 Chappell also won the Ton Litter Contest in National Duroc Swine competition. This carried an award of $75.00 as well as the National recognition.

4-H Demonstrations In North Carolina

Beekeeping proved popular last summer during the 4-H district elimination contests in North Carolina. Most of the beekeeping demonstrations dealt with the correct way to start beekeeping. In several instances an individual competed against a team.

A list of topics and the rules of competition were sent to all counties in March. Besides beekeeping, other subjects to choose from were vegetable marketing, use of dairy products, clothing, farm and home electricity, public speaking, cooking, and so forth. The 4-H County Agent and Home Agent and members of the Extension Staff enlist boys and girls in projects of their choice in their counties. Agents train them in the best way to present their topics and if there is more than one contestant they hold an elimination contest in the county.

North Carolina is divided into six districts and each district leader arranges the district competitions. In districts where there are local beekeeping organizations the officers are often asked to act as judges of the beekeeping contests. Winners in district competitions are then groomed for competition at State College, Raleigh, N. C. during 4-H Club Week.

Last year each entrant in beekeeping, either individual or team, received an award. Because of the fact that some subjects had no sponsors, only the announcing and recognition of the winner at the final assembly was featured. Awards were made later at 4-H Achievement Day, held in the counties. Local beekeeping supply dealers furnished awards, ranging from a complete hive for the winner to books for beginners.

District winners were also invited to present their demonstrations at area and state beekeepers meetings.

W. A. Stephen,
Extension Beekeeper

Controlling Hornet Damage

by Geo. P. Georghiou

IN FACE of determined attacks by hornets desperate endeavors are sometimes required for defense of the hives. Stalwart resistance is made with makeshift weapons, sometimes with a thorny branch or a board. One beekeeper dispatched in his own bee yard over 2,000 hornets in a day and over 10,000 in a week. But the attack persisted; furthermore the disturbance excites the bees, making them in some cases unapproachable for days.

The nest of this enemy of the bees, the hornet.

Attack is the best form of defense in this case, and that means locating the nest and destroying it. Since hornets can fly distances of up to two miles or more, the entire area within about two miles from the bee yard is involved, the search is best done in late afternoon when the hornets are flying low and slowly, and may easily be followed to their nests. The nests can be destroyed by blowing in a small quantity of calcium cyanide dust with an ordinary duster.

Please consult the Extension Service in your area if you need a demonstration. Calcium cyanide is a poison and should be handled with care. Avoid breathing the dust and vapor, especially indoors.

In addition to destroying the nests, some beekeepers use a small wire screen at the hive entrance which will allow bees to go through but will keep the hornets out. This works well with weak colonies; strong colonies will cluster out of the screen on the landing board and will still be exposed to the hornets.

Federation Requests Additional Research Funds

The Research Committee of the American Beekeeping Federation, headed by its chairman, Clarence L. Benson, appeared before the House Agriculture Appropriations Committee on March 8, and on the following day appeared before the Senate Subcommittee. The purpose in appearing before these two Subcommittees was to obtain additional funds for research pertaining to beekeeping.

The amount requested was $200,000 and was broken down into the following categories: (1) Pollination—$100,000; (2) Honey House and Beekeeping Equipment—$50,000; and (3) Honey—$50,000.

Attending these hearings and presenting testimony on behalf of the industry in addition to Clarence Benson, were: R. B. Willson representing the Honey Industry Council of America; Alan Root representing Bee Industries Association; N. C. Jensen representing the American Bee Breeders Association; and Henry Schaefer and Robert Banker, president and secretary-treasurer, respectively, of The American Beekeeping Federation.

For purpose of review and preparation of testimony to be presented before the Appropriations Subcommittees, the group had the assistance and guidance of Jas. I. Hambleton, Harold Clay, Dr. E. G. McKibben, Henry M. Bain, Dr. T. E. Hienten, and Dr. A. H. Moseman, all from the U. S. Department of Agriculture. Following the hearings, calls were made at important offices in the Department and on a number of Senators and Representatives.

The testimony of the Research Committee at the hearings and the interviews in important offices were both received with courtesy and full consideration. The House Committee will recommend that a representative of the honey industry be placed on at least one Research Advisory Committee, and it is currently reported they have approved the industry's request for the additional research funds. Throughout the Department of Agriculture assistance and cooperation were extended freely.

Coating for Wax Kettle . . .

Vernon Adee (Nebraska) uses a coating of honey on the inside of the kettle he uses for the hot beeswax to keep the wax from sticking to the kettle when it cools.

Krieger's Cathedral

About a year ago, the Iowa Association had a field day at the home apiary and gardens of Peter P. Krieger, Princeton, Iowa. It was quite a gathering of real enthusiasts and our host, Mr. Krieger, had something for us that is above the ordinary in his gardens. This beautiful, large, rock garden is named Admiration Gardens and it has been developed with great care and love by Mr. Krieger in memory of his wife. Another annual picnic will likely be held there this June. A friend of our Editor's daughter, Miss Mary Curran, of Clinton, wrote this poem about Peter Krieger which is very appropriate for the man and his high character.

If I could walk with God today
  I'd take Him by the hand
And together we would wander
  Through the garden I have planned.
I would show Him how a hillside
  That before was bleak and bare
Has become my own cathedral
  And my truest form of prayer.
We could climb each path together
  That I've marked for mortal feet,
And I'd show Him all the beauty
  That has made my labor sweet.
He would see the pines I've planted
  That are straight as any spires,
And the blossoms in profusion
  That the love of Him inspires;
And the blue bells in my chapel
  Are the only ones that ring,
And the choirs of my songbirds
  Are the only ones that sing.
For though other men may praise Him
  With their words and music grand,
Jesus prayed amidst the Olives
  And I'm sure He'll understand.

Mary Curran

Honey in Canning . . .

Campbell's manual on pickling, canning and preserving is a standard work of some 220 pages, and a good one at that; yet the only mention of honey is for honey vinegar, not recommended because of the high cost of honey in making it.

We wonder just why the possibilities of honey in canning are omitted.

Monument to Langstroth? . . .

"Spectator" magazine which in each issue recommends a monument to celebrated inventors, like James Spangler, inventor of the carpet sweeper, is recommending in its January 1955 issue, a monument to L. L. Langstroth as inventor of the movable frame hive, the motif, a shaft of marble surmounted with a comb of honey.

Some Experiences With Sulfa*

by V. G. Milum

OUR experiences with feeding of sodium sulfathiazole for control of American foulbrood have given varying success while indicating some possibilities of failure when certain conditions are not present. In a 45-colony apiary, an A.F.B. diseased colony was found being robbed in February 1947. It was destroyed by burning, but during the following spring five additional colonies were found infected and were treated by feeding of sodium sulfathiazole in sugar syrup at the rate of ½ gram to one gallon of syrup.

Colony No. 21 was fed 10 pounds of sulfa syrup on April 29 and again on May 14. On June 7 a few diseased cells were found. On June 19, an additional quart of sulfa syrup was fed. On June 23 and September 9, 1947, and through 1952 this colony appeared to be free of disease.

Colony No. 27 was fed 10 pounds of sulfa syrup on April 30. Examination on May 25, June 23, July 1, and September 9, 1947, and through 1952 has shown no A.F.B.

Colony No. 43 was fed 8 pounds of sulfa syrup on May 14. On June 8, 1947, 12 diseased cells were evident, but none on June 21, July 14, and September 9, 1947, and thereafter through 1952.

Colony No. 10 was found heavily infected on June 30, 1947, after Demaree supering. Treatment consisted of sprinkling ½ pint of sulfa syrup on the lower-body brood combs on June 30, July 14, and July 21. Examination on August 6, and September 9, 1947, showed no disease and none through 1952. There seems to be no good explanation to explain why there was no recurrence because of contamination from the super combs, except that a brood nest was maintained in the upper Demareed portion during the sulfa feeding period.

With the apparent success on the first feedings, Colony No. 44, badly infected and previously Demareed, was fed 4½ quarts of sulfa syrup by six sprinklings on the brood combs between June 9 and July 21, 1947. Although originally marked for disposal by burning because of being so badly diseased, the number of evident diseased cells was 237 in 11 frames on July 7, 55 in 9 frames on July 14, 18 in 7 frames on July 27, and none on August 5. The three supers of surplus honey were removed and extracted and the wet combs returned to the colony for cleaning. No evidence of disease was found on September 9, 1947, but on September 8, 1948, a few cells of A.F.B. were found. One cannot be sure as to the origin of this infection, but it probably was a carry-over. On October 8 the colony was fed 10 pounds of sulfa syrup, but on May 27, 1949, a few cells of A.F.B. were located. A feeding of 5 pounds of sulfa syrup was made and since that date through 1952 the colony appears to have been free of disease.

On April 8, 1948, colony No. 4 was discovered to be robbing colony No. 5 which was found to be A.F.B. infected. Colony No. 3 was fed 5 pounds of sulfa syrup at once with the result that A.F.B. never developed in the colony through 1952. Colony No. 4, being rather weak was removed to the greenhouse for sulfa feeding. It was able to clean up the disease in the area occupied by the brood nest but scales remained in the outer combs. With the expansion of the brood nest to all 11 frames, a few diseased cells were found on September 10, 1948. After another feeding of 5 pounds of sulfa syrup, apparently all scales were removed and disease has not appeared from 1949 to 1952.

Other than the instances cited, no other colonies have developed A.F.B. in this yard through 1952. What are the factors of success and failure in these experiences? First, it is apparent that colonies robbing diseased honey, at least during a dearth or in winter months may be prevented from contracting A.F.B. by light feedings of 5-10 pounds of sulfa syrup. The secret of success here seems to be that no spore-infected honey is stored as surplus but is all used in the brood chamber as food.

On the other hand, a colony found diseased during the honeyflow may have some spore contaminated honey stored in the supers, especially if Demareering has been previously practiced. While sprinkling of sulfa syrup directly on the brood combs may clear up the disease at the time of feeding, disease may reappear later from super sources. Only careful watching and checking will prevent future troubles, through scattering of infected combs. While early detected infestations may be cured by immedate feeding, the danger of super contamination is a risk that should be carefully scrutinized.

* Contribution from the Department of Entomology, University of Illinois, Urbana.

Two-Queen Comment

by E. S. Miller

Referring to the Editor's article in April 1954 ABJ, page 132, it is a plan similar to a method which practically doubled my per colony production. Strong colonies are divided in early spring and placed side by side. The one moved is given most of the brood and a young queen and supered. About the beginning of the main flow, the two colonies are united with queen excluder and sheet of newspaper between. In a few days, bees and queen are shaken and run in below. The young queen kills the old queen and effects automatic requeening. If queen cells develop in the top section they may be disposed of.

By this method one avoids rearing a large amount of brood and bees at a time when they are not needed and become merely consumers. Few beekeepers realize the enormous amount of honey consumed in useless brood rearing during the honeyflow. I would consider it a disadvantage for both queens to continue to lay. Better build up all brood possible BEFORE the honeyflow and restrict it by eliminating one queen during the flow. Building up the two colonies side by side appears preferable to placing one atop the other as such schemes require too much labor.

Pellett Gardens' New Folder

Write for your copy of Pellett Gardens' new folder on honey plant seeds and cuttings. In view of the possibilities of "Pellett clover" since an inoculant for the seed has been found this plant may renew its interest generally in agriculture and beekeeping, though very little seed is at present available.

Honey and Your Diabetes

No. 2 by D. C. Jarvis, M.D.

IF organized medicine teaches that honey shall not be used in diabetes mellitus and Vermont folk medicine teaches that honey may be used in diabetes mellitus with good results wherein does the difference in their medical reasoning lie? It is well to remember that organized medicine concentrates its medical thinking on the microorganism and the virus. Within this framework of medical thought it has built up the theory of infection. In developing new therapeutic agents it endeavors to devise those which will put a speedy end to the infection and thus free the individual from sickness. However, there are conditions such as hay fever, asthma, migraine headaches and diabetes mellitus that are not solved by thinking within the medical framework that focuses attention on the microorganism and virus as the cause of disease. These conditions require a different approach and a different type of medical thinking.

Vermont folk medicine believes that varying conditions of environment make demands on many individuals which they are unable to meet. This failure to meet these environmental demands results in a changed body chemistry which is thrown out of balance. This altered body chemistry changes the behavior of different minerals in the human body with the result that the body now becomes suitable soil for the production of chemical conditions represented by diabetes mellitus. Our present speed of living and the economic requirements which must be met represent the stress which often brings about a disturbed balance of body chemistry.

If one continues to live close to the soil and to study wild and domestic animals and fowl his medical thinking leads him into the field of biochemistry where he learns that no human being or animal or fowl has anything to fear relating to sickness if the chemistry of the body continues within normal limits. One learns that potassium is the most important mineral and one must have a daily supply of this mineral in order to have continued good health. Potassium as found in nature is associated with an acid and for potassium to be effective in the body an acid must be given with it. This type of medical thinking leads to recognition of a group of diseases as being potassium deficient conditions. One then looks about him for sources of potassium that may be taken day after day. The first on the list is honey. Next come the fruits, berries and leaves which may be dried for use during the colder months of the year. Then we have various homemade wines and herbs to be made into herb tea when the need arises.

Most people look upon honey as a pleasant table sweet but if you look below this sugar surface you realize that in nature potassium is associated with an acid and sugar. It is a waste of time to give potassium without the accompanying acid. I first learned this when studying dairy cows. Honey is acid in reaction. Don't think of honey as just another sweet. Think of it as an excellent source of potassium packaged as nature intended it should be packaged with an acid and a sweet.

Let me illustrate the value of potassium. According to Sherman, apple cider vinegar contains potassium. If I add a half teaspoonful of apple cider vinegar to a cat's ration each day I will note that in about two months the fleas will leave the cat's body and if any worms are present in the digestive tract they will leave also. If I add one tablespoonful of apple cider vinegar to the daily ration of each dog in a kennel of Brittany Spaniels I will note that in about two months these dogs will no longer pass worms and the fleas will leave each dog. If I pour two ounces of apple cider vinegar over the ration of a dairy cow at each feeding twice a day the lice will leave the cow's body and when this cow is on pasture the flies will not bite her. If I add apple cider vinegar to a farm horse's ration each day, one teaspoonful for each 100 pounds of body weight, the worms if present in the manure will disappear. Knowing that potassium given in an acid medium will cause worms, lice and fleas to leave an animal's body and that flies will not bite a herd of dairy cows receiving potassium at each feeding it is not difficult to understand how closely potassium is related to our continued good health. With the proper amount of potassium present in the body the body tissues do not represent a happy hunting ground for harmful microorganisms. When Vermont folk medicine advises the use of honey in diabetes mellitus it is prescribing potassium packaged in nature's most pleasant way. Vermont folk medicine considers diabetes mellitus as being a potassium deficient disease.

You Asked for It . . .

If you have any questions for which you need an answer, address them to Frank E. McLaughlin, American Bee Journal, Hamilton, Ill. He will give you the answer himself, or he will get you an answer from the best source possible. This service is free.

Rayburn Tolen, Missouri

I believe I have some foulbrood in my bees. Can you tell me how to use terramycin?

In the January 1954 issue of ABJ is an article by Joseph O. Moffett entitled "Preventing and Controlling EFB." He tells of using TM-5 dust, an animal mix, which contains 5 grams of terramycin per pound. The TM-5 was mixed with an equal amount of powdered sugar, sifted, and dusted over the top of the frames. For each dusting 15 grams of TM-5 and 15 grams of powdered sugar was used and applied three times at weekly intervals.

Some beekeepers have been using terramycin for European foulbrood with favorable results according to the reports. Sulfathiazole proves better all around for American foulbrood. One 7-7/10 grain sulfathiazole tablet mixed to each gallon of sugar sirup is the right amount. The sulfathiazole tablet has to be crushed and mixed in a little hot water, before adding to the sirup.

Donald H. Williams, Maryland

What should be done with combs that still contain honey? Should empty supers be removed from the colony for winter?

There are several things to do with combs containing some honey. Set a hive body containing the combs back on a colony over an inner cover (that is the inner cover between the hive of bees and the super of comb). Be sure to take the bee escape out of the inner cover. The bees will carry the honey down into the hive. Or the frames can be set out 15 or 20 feet from the bees. The bees will carry the honey back to the hive. This must be done on a warm day when bees are flying well.

By all means remove empty supers from the colony for winter. Supers on the bees in winter only make more space for the bees to heat. Supers with foundation in them should be removed also. The bees will travel-stain the foundation and on warm days, when the cluster is broken, they will chew it.

Charles E. Hall, Missouri

I am planning to start a honey plant garden. Which flower seeds are most advisable to plant and where can I get them?

Here is a list of honey plants that are attractive to bees: Wild marjoram is a good perennial for bees; pin clover or alfilaria yields honey and pollen in the spring; vetch is a legume that grows in acid soil, honey from it is slightly amber and of good flavor. Birdsfoot trefoil does better than most clovers on poor soil and is a good nectar source. Yellow or white sweet clover and white Dutch clover are good sources and do well in moist soil. Meadow sage resists drought and reseeds itself; garden sage is attractive to bees and the honey is good. Alsike clover also grows on moist soil and is an excellent honey plant. Aster provides an abundance of fall nectar as does goldenrod if conditions are right. Aster honey is thick and granulates rapidly. Others it might be well to plant are golden cleome, anise hyssop, purple loosestrife, golden honey plant and motherwort. More information and seeds may be obtained from Pellett Gardens, Atlantic, Iowa.

Building Up

by David A. King

THE operation of uniting the new queenright colony with my drone layers was a definite success. A quick check about ten days later showed the newspaper to be practically all gnawed away and life in the hive had evidently settled into something resembling a normal routine. The upper brood chamber, the one originally belonging to the queenright colony, was rapidly becoming filled with drawn comb and there was quite a good deal of capped brood—good worker brood. It was still a little early to expect any emerging brood.

Evidently the laying workers had either eliminated themselves or been eliminated somehow by the bees.

As time went on, there were still further symptoms that all was at last going as it should. For one thing, the bees developed a "temper." During the time when the colonies were weak and things were not as they should be within the hive, it had been safe to open the hive at any time to look things over with no smoke or veil. About the worst they would do was to send out one or two scouts to buzz around your head semingly more curious than aggressive. Now, if the hive were opened without smoke, they would boil up over the tops of the frames ready to launch a real attack to defend their home.

I believe that it is pretty generally recognized that practically any colony in which things are going as they should is ready to defend itself. This is true whether the bees happen to be "gentle" bees such as Caucasians or Italians or whether they are the common black bees. The practical difference in this respect is that some of the "crosser" bees make their attack more widespread if they are disturbed; and they settle down much more slowly. Accordingly, I was pleased to see that my bees were ready and willing to defend their home.

As time went on, the activity at the entrance to the hive became more and more intense. Evidently there was a good deal of emerging brood and the time came when the air in front of the hive was full of bees taking their "play" flights.

The beginner can read of these flights time and time over in the literature, but until he has actually seen them he will not really understand what the writer is referring to. At times there were literally thousands of bees circling above the hive up and down, around and around—yet there was no inclination for them to cluster as they would if they were trying to swarm.

At this time, I opened the hive to see how they were coming. There were no queen cells. There was practically no drone brood. The drone brood I had found in the old colony had all emerged or been destroyed and many of the cells were now full of honey and capped. Some were full of worker brood.

I also noticed that practically all of the foundation had been drawn and I thought that likely the time was ripe for "supering."

I ordered two shallow supers complete with thin foundation as I had decided to work for "cut comb" honey. Incidentally, this is good advice for any beginner as "cut comb" is just as easy to produce as extracted honey as far as apparatus in the hive is concerned, yet the beginner need not be burdened with the cost of an extractor and all of the extra apparatus that goes with it.

I placed one super with full sheets of thin foundation on the hive, holding the other in reserve to put on later.

I had picked a poor time to put the super on, though, as I found out on checking the hive some ten days later. The foundation had pulled loose or been gnawed loose by the bees in many instances and was hanging crookedly in most of the other cases. I would suggest that beginners (like myself) fasten foundation both top and bottom particularly if they are using the thin foundation for comb honey.

Two sheets had come loose entirely, so I removed the frames and took them to the house. I had the best of intentions regarding those frames. I certainly was going to put new foundation in them and put them back in the super. The next time I checked, the bees had drawn all of the foundation in the super and had built themselves a crooked comb in the place of the two frames I had removed.

Things were progressing at last, and it looked like I might be going to have a little honey in spite of the late start. Time alone could tell.

Our Cover

Black locust, as this picture shows, sometimes is in sufficient abundance to yield considerable honey although, from one year to another, it is an uncertain yielder and cannot be depended upon for crop. It gives a tremendous boost, though, to brood rearing and often brings on the first swarms of the season for strong colonies. The cover shows a bloom cluster. The wonderful odor of these tree blossoms is often to be noted at considerable distances.

Royal Jelly Needed . . .

Another summer with its swarming season is soon here with many beekeepers in the North and in swarm control operations, many pounds of royal jelly will be thrown away. Since there is considerable evidence royal jelly does have growth stimulating properties worthy of further study, perhaps some beekeepers are willing to save some of this jelly for experimental work. I have several doctor friends who would like very much to do some of this experimental work and are looking for a supply of jelly. Since this work is all still experimental, all this work will have to be done gratis and the jelly supplied the same way. Any beekeeper interested can send me what they can collect in small, tightly covered jars and I shall give it to these doctors as they need it. The jelly from unsealed cells is best and should be kept clean of larvae and wax and refrigerated in an ordinary refrigerator. It should not be frozen unless kept for long periods of time. When shipping by mail, royal jelly needs no special packing except against breakage.

Charles Mraz,
Box 127,
Middlebury, Vermont

Honey and Beeswax Imports and Exports

1954 figures for exports and imports are now available. They show total exports of honey of 24 million pounds, half of the total being in September and October, and seventeen million of the total being sent out through the ports of Los Angeles and San Francisco. In the same period over nine million pounds was imported nearly all through the ports of New York, New Orleans and Philadelphia.

In the same period nearly four and a half million pounds of beeswax was imported, Cuba being the heaviest source of supply, with Abyssinia, Dominican Republic, Turkey, Angola, Egypt and Chile not far behind. Brazil which used to be in top rank as an exporter of beeswax has now sunk to rather minor importance, probably partly due to the rapid rise in modern agriculture, as well as a similar advance in beekeeping so much of the beeswax is consumed at home.

In Memoriam

Carl Neff

In the death of Carl Neff of Boonville, Missouri, on March 3, 1955, beekeeping and fruit-growing lost one of their pioneers and most faithful members. For the fruit and honey exhibits at our state and county fairs Mr. Neff was always ready to do his part and more, and he always succeeded in taking home his share of the prizes. He seemed able, always, to produce top quality products and to display them to best advantage in bringing out the real advertising value of exhibits. We in Missouri will also miss his friendly smile and wise counsel at our future beekeeping meetings.

by Leonard Haseman
University of Missouri

Recipes---

Ladies, do you have favorite honey recipes? Send them in. Your subscription will be credited an additional three months for each recipe published.

CHOCOLATE PECAN SQUARES

⅝ cup all-purpose flour	½ cup sugar
½ teaspoon baking powder	2 eggs, well beaten
½ teaspoon salt	½ cup honey
¼ cup shortening	½ cup broken nut meats
2 squares chocolate	1 teaspoon vanilla

Sift flour, baking powder and salt together. Melt shortening and chocolate together over boiling water. Add sugar to eggs and beat well. Add honey gradually and beat thoroughly. Add chocolate mixture and shortening, and beat well. Add dry ingredients, nuts, and vanilla. Place whole pecans on batter in pan before baking. Bake in greased 8 x 8 x 2-inch pans in moderate oven 350° F.) 40 minutes. When done, cut into squares so that a pecan meat will be in center of each square.

(Tempting Honey Recipes from Sue Bee.)

The following two recipes are especially welcome during the summer when one is apt to have some sour milk which they hate to waste.

Old-fashioned chocolate cakes, when made with sour milk, have a wonderful dark red-mahogany color.

HONEY CHOCOLATE CAKE

½ cup shortening	1 tsp. baking powder
¾ cup HONEY	¾ tsp. baking soda
¾ cup brown sugar	½ tsp. salt
2 eggs	1½ cups sour milk
½ cup cocoa	1 tsp. vanilla
2½ cups cake flour	

Cream together shortening, honey, and brown sugar. Add eggs, one at a time, beating after each. Sift together, cocoa, flour, baking powder, baking soda and salt; add alternately with milk to creamed mixture. Add vanilla. Pour into three greased 9-in. layer pans and bake in a moderately hot oven (375° F) for 25 minutes. Cool for 5 minutes, then remove layers from pans and cool on rack.

HONEY CHOCOLATE FRUIT DROPS

½ cup shortening	1 tsp. baking powder
½ cup HONEY	½ tsp. salt
½ cup sugar	6 tbsps. cocoa
2 eggs	¾ cup raisins
2 cups flour	½ cup chopped nuts
1 tsp. baking soda	½ cup sour milk
	1 tsp. vanilla

Cream together shortening, sugar and honey, then add eggs, one at a time, beating well after each addition. Sift the flour, baking soda, baking powder, salt, and cocoa, and add alternately with the sour milk to the creamed mixture. Add raisins, nuts, and vanilla. Drop on buttered cookie sheets, and bake in moderate (350° F.) oven from 12 to 15 minutes.

Mrs. J. A. Chandler, B. C., Canada

ABIE STINGS SEZ:

They always used to say: "A swarm of bees in May is worth a load of hay." Don't let that old sayin' fool you. Hay was sellin' for a dollar a ton and wagons held about a half a ton—so after you figure it out, maybe you'll be a little more interested in swarm control. The only time the bees in a swarm is valuable is when they are in their original hive gatherin' honey and not thinkin' about swarmin'.

A New Way to Requeen . . .

The proper time to requeen (in this part of the country—Wisconsin) is in July during our basswood flow when the flow is rapid. When the queens are at hand, the zinc at one end of the queen cage is removed and in its place a stick about two feet long is inserted in the hole to keep the queen confined. The queen cage is then pushed into the hive along the bottom board and allowed to remain there. After three days, when you have a sunny day with a good flow, pull on the sticks to release the queens. This way of requeening without dequeening is successful in most cases, as the young queen usually kills the old one.

Julius Lysne, Wisconsin

Farmers' Bulletin on American Foulbrood

Farmers' Bulletin No. 2074, titled "American Foulbrood of Honey Bees —How to Control It," issued last September, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. for 10c. It is the best yet and worth anyone's study. It is written by A. S. Michael and contains complete descriptions with symptom table of American and European foulbroods and sacbrood, good illustrations, control methods and preventive drug treatments.

Creamed Honey . . .

The title of a four-page folder by American Honey Institute on creamed honey and its uses, with quite a few suggestions and recipes. Available from American Honey Institute, Madison, Wisconsin.

To Prevent Rotting Of Bottom Boards

The best thing I have found for this is to give the bottom boards several coats of creosote with an ordinary paint brush; six or seven coats allowing each one to dry well before applying the next. This can be done during winter. Next spring put them under the hives and use the same procedure with the ones removed. The coating of course is put only on the outside. I keep my hives raised on two bricks which gives an air space underneath and they are just as good as when placed in 1947, with no applications since. This leaves no space for mice to hide.

R. C. Burcham, Illinois

Young Bees for Pollination

Beecraft for January, reporting on activities at the Rothamsted Experimental Station in England on the foraging of honey bees, mentions Butler's work indicating that in general bees restrict their foraging to an area roughly 5 yards in diameter. Crane and Mather got about the same results in endeavoring to get isolation for different varieties of radishes.

Butler suggests that cross pollination of fruit would not be so effective if such was the case and that there must be many "wandering" bees, which are probably young bees which have not yet become acclimated to their out-of-door work.

Harry Whitcomb in California has reported that best pollination for alfalfa was possible when the colonies of bees were exchanged for new ones at set intervals, when the old established colony seemed to drop off in pollination effort. Probably the same reason—young bees are best.

Caucasian or Italian Package Bees and Queens

Bees gentle to work with, less swarming, good producers, health certificate, live arrival guaranteed are just a few things you get when your requirements are sent to me. Prices are:

Quantity	1-25	25-50	50-100
2-lb. pkg. w/q	$3.00	$2.90	$2.85
3-lb. pkg. w/q	3.90	3.80	3.75
4-lb. pkg. w/q	4.85	4.75	4.65
5-lb. pkg. w/q	5.80	5.70	5.50
Queens	1.05	1.00	.95

FARRIS HOMAN Shannon, Miss.

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We have reprinted in 4-page form, the series of articles by Dr. D. C. Jarvis on "Honey Is Kind to Your Heart." These are available from the American Bee Journal office at the following prices, Postpaid:

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Here and There

Colorado

Superior and Brockway donate honey and glass to CHAC booth at Stock Show.

The CHAC honey booth at the recent Denver Livestock Show gave away 2,318 jars of honey. The Brockway Glass Co. gave the six-ounce jars (which held 8-ounces of honey) to CHAC. The Superior Honey Co. furnished the honey and the labor to fill the jars. A Colorado honey cap was used on the jars, which carried no packer's label.

Washington

The Central Washington meeting in Yakima February 5th was well attended. Of all the meetings to which I have been this one topped them all, particularly in instructions on fundamental beekeeping. E. B. Purchase, Yakima County Deputy is commended on the fine work he has done in bringing his actual findings in routine inspection to the beekeepers. I often wonder why we haven't learned more of the findings and problems of the inspectors in the same way Mr. Purchase has done.

T. H. Rownes
Walla Walla

California

In a report in "Bee Business" Elbert R. Jaycox, Apiary Inspector, tells of branded bee equipment that was stolen in 1954:

The theft of nine lots of bees, totaling 316 hives, was reported to the Department of Agriculture during the last year. Most of the equipment was branded and several of the owners involved have never sold any of their equipment. The stolen equipment may have been sold or may later be offered for sale. Prospective purchasers of bee equipment should check all the brands present on the equipment. If there is a question concerning ownership, the Department will furnish information about the brands recorded for any beekeeper.

Anyone finding equipment bearing brands listed below should report it to the office of the County Agricultural Commissioner or to the California Department of Agriculture, Sacramento. The ownership of the equipment can then be established. Each stolen lot is listed according to amount stolen, brand or brands, the approximate date the loss occurred, and the location of the bees when stolen.

20—2-story, -8-190 (possibly -1-133), March 1, 1954, El Modena, Orange County.
8—2-story, -1-487, April 1954, Los Angeles area.
10—3-story, 19-55, June 1, 1954, Bear Valley, San Benito County.
104—2-story colonies, 1-279- Bakersfield. (Report to Bee Business, Los Angeles County).
8—2-story, -9-211, August 6, 1954, Murray, Kings County.
8—2-story, 37-38, July 1954, Williams, Colusa County.
84—1-story, 12 2-story, -1-729, November 1954, Buttonwillow, Kern County.
96—2-story, -1-327, -1-222, SW, November 1954, Buttonwillow, Kern County.
5—2-story, 14-50, 14-54, November 1954, Bakersfield.
65—4-story, 18-54, -1-572, December 1954, Westmoreland, Imperial Co.

Minnesota

Honey Queen Needed

Beekeepers who attended last summer's Detroit Lakes meeting will remember that a honey queen contest was scheduled. However, no candidates appeared. Miss Frances Sundberg was drafted by the meeting and graciously consented to serve. A beekeeper in her own right, she made an excellent impression at the State Fair as a representative of the industry. Included were appearances at the beekeeping exhibit at the fair, and on the WCCO radio Farm Program.

We cannot expect that such an able representative will be handy at each summer meeting, or that we could be fortunate enough to convince her to serve on short notice. A second attempt will be made to select a Honey Queen at this summer's meeting, and the following qualifications below should be noted:

a. Age, 19-27.
b. Single.
c. The candidate must be sponsored by a beekeeper, packer, broker, dealer, or associated industry. She need not be a relative of a beekeeper, but some knowledge of beekeeping is preferred.
d. One good picture in street clothes to be submitted to the queen committee by June 1. Pictures may be forwarded by way of the president of the association.
e. Three impartial judges will be supplied.
f. Judging to occur on the first day of the summer meeting.
g. Judging based on poise, personality, attractiveness, and voice.

Award: a wrist watch.

Duties: personal appearances as arranged by the committee.

(From the Minnesota Beekeeper).

* * *

Minnesota Beekeeper Changes Editor

Beginning with March 1955, The Minnesota Beekeeper will be edited by T. A. Gochnauer, University Farm, St. Paul 1. All material in the form of articles, suggestions for articles, notes and beekeeping news should be sent to him at that address. He replaces Mr. Clarence G. Langley, Red Wing, Minnesota, whose many other duties and responsibilities have forced him to discontinue as editor. In order to maintain the magazine at the high level of clear and informed presentation of beekeeping problems it has enjoyed under Mr. Langley, the following policy will be adhered to: editorials will be written by members of the industry itself; articles will be requested from all phases of the industry, including commercial and hobby beekeepers, packers, and beekeeping organizations; suitable articles from research men will be included, written in popular form. In this way, it is hoped that gaps in the editor's knowledge of the industry's problems will be filled by persons most capable to do so, and the journal will not develop the one-sided slant of a research specialist.

Illinois

Inspection

The 37th report of the Illinois Department of Agriculture contains Chief Inspector Killion's report on 1954 inspection. Of the 37,138 colonies inspected 2½ per cent showed American foulbrood. The "hot spots" seem to be around Peoria, Springfield, and Jacksonville.

Arkansas

Our appropriation for the maintenance of the State Apiary Board was approved by the Legislative Council without a dissenting vote as it was presented, (without change). Also, the Senate which acted on it first, passed the appropriation without a dissenting vote. At this writing the bill is on the House Calendar and in the House Budget Committee, awaiting other budget matters, for final passage. No further complications are anticipated to the bill's final passage and subsequent signing by the governor.

It is to be greatly regretted that no one registered a desire for Mr. Head to write further articles on "Queen Rearing" that I requested him to do. It is my belief that Mr. Head has a very great amount of valuable knowledge along this line that we might all profit by. Mr. Head felt, however, that he should not continue unless the beekeepers expressed the desire for him to do so.

It was my hope that we might assemble the combined know-how of our most prominent beekeepers into a **State of Arkansas Handbook on Beekeeping.** I sincerely hope that this may be accomplished at some time.

Beekeepers desiring extra early inspection for specific purposes should inform us at their very earliest convenience so that we might make arrangements to comply as near as possible to their wishes.

George W. Freeman,
Chief Inspector

Nova Scotia

Orchard Pollination

E. A. Karno, apiarist, and R. Vickery, entomologist, are authors of Circular 67 of the Nova Scotia Department of Agriculture, entitled, "The Place of Honey Bees in Orchard Pollination."

They found that honey bees generally restricted their visits to a single tree, or even half a tree; less than a third of them ranged over two or three trees and a very minor number over a larger group. So renewal of the pollination force by the emergence of new young bees, even for the short time pollination was possible, was highly desirable. This, together with lack of competing nectar sources and contiguity to the orchard, were necessary for best pollination, the weather being a primary determinate.

On permanent sites of an apiary in the orchard 10 to 20 colonies were considered sufficient for a quarter acre of bloom. As has been found profitable in alfalfa pollination, rotation of colonies is desirable. Pollen inserts, requiring that outgoing bees pass over pollen in a trough, is also used to advantage.

Seed Prices Higher . . .

Without exception, legume seed prices are higher than a year ago, the average advance being in excess of 20 per cent. This is partly caused by the failure in seed harvest in 1954 of many dry areas and partly to the extra impetus given to legume seeding on account of the higher price as well as the drought.

Cheryl Ann Barth . . .

One of the two little girl models on the cover of "Gleanings" for April is the daughter of Walter Barth, Associate Editor. Don't know which one but we venture the guess that it is the little girl at the right (and may the Saints preserve us if we are wrong). Walter took the picture to tie in with Honey for Breakfast Week.

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MEETINGS

Westchester County
New Rochelle, N. Y., May 15

The Westchester County Beekeepers Association will hold its next regular meeting at 2:30 p.m. sharp on Sunday May 15 at the Odd Fellows Hall, 20 Lockwood Ave., New Rochelle, N. Y.

A film pertaining to bees will be shown and a demonstration will be held on installing package bees.

An invitation is extended to all beekeepers and their friends. A pleasant afternoon is in store for all those who attend.

Refreshments will be served.

Mrs. Alfred Roth, Publicity

Middlesex County
Weston, Mass., June 4

The Middlesex County Beekeepers' Association (Mass.) will hold its first outdoor meeting for the 1955 season at the home and apiaries of member Mrs. S. S. Fitzgerald at 62 South Avenue, Weston, Mass., on June 4, one week later than usual due to the long Decoration Day weekend falling on the regular date. All beekeepers in the area are welcome to attend, and bring their picnic basket for the evening meal. The Association will furnish coffee.

We are pleased to announce that the Association was awarded the Silver Medal and a Special Prize for their exhibit at the Flower Show held in Boston in March.

At our April meeting we were most fortunate to have as speaker Mrs. M. Louise Yates who spoke on her beekeeping tour through eleven European countries and showed beautiful colored slides taken on her trip. It was a real treat to hear and see about beekeeping in other countries, and the evening was enjoyed by all who attended.

L. C. Proctor, Sec'y

Beekeepers Short Course
University of Minnesota
May 11-13

Wednesday, May 11, 1955

8:00 a.m.—Registration.

9:15—Beekeeping and beekeepers through the ages, M. H. Haydak.

10:00—How to begin with bees, G. H. Cale.

11:00—The life story of the bee, M. H. Haydak.

12:00—Lunch.

1:30 p.m.—Value of bees in pollination, F. G. Holdaway.

2:30—Food for bees, C. D. Floyd.

3:30—Demonstration in the apiary of installing package bees, M. H. Haydak, C. D. Floyd, G. H. Cale.

Thursday, May 12, 1955

9:00 a.m.—Management of colonies for honeyflow, G. H. Cale.

10:00—Honey harvesting, processing and marketing, C. D. Floyd.

11:00—Honey as food, M. H. Haydak.

12:00—Lunch.

1:30 p.m.—Preparing bees for winter, C. D. Floyd.

2:30—Queens for the future, G. H. Cale.

3:30—Demonstration of standard practices of beekeeping, M. H. Haydak, C. D. Floyd, G. H. Cale.

6:30—Informal Meeting. Mr. G. H. Cale will speak on "Use of chemicals and drugs in beekeeping practice." This is an opportunity to visit and exchange ideas.

Friday, May 13, 1955

9:00 a.m. — Bee diseases and the sulfathiazole controversy, T. A. Gochnauer.

11:00—Beekeeping legislature, T. L. Aamodt.

12:00—Lunch.

1:30 p.m.—Beekeeping movies.

2:30—Question box (a box will be provided in the classroom for questions of any type. These questions will be discussed by staff members).

New President for Cook-DuPage

Looks like the ladies did it again! It's a "Woman's World" after all.

At a meeting of the Executive Committee of the Cook-DuPage Beekeepers' Association on April 11, Mrs. Wm. Wallanches of Downers Grove, Ill., was given a vote of confidence to take over as president of this association. Formerly Vice President of the Association, she succeeded Mr. Roy Stockdale who had moved to Southern Illinois.

Conventioneers of the American Beekeeping Federation will well remember Mrs. Wallanches as the Chairman of the Entertainment Committee for the Ladies' Auxiliary, and the splendid job she did.

John Lis

Iowa Short Course
Ames, May 10-11

The Annual Short Course for beekeepers will be presented by Iowa State College on May 10 and 11. This is a service of the College for beekeepers and the honey producing industry of the state of Iowa. Anyone who is interested in bees for any reason, whatsoever, will find this course of value to them. The program for the first day deals primarily with management and marketing problems. The program for the second day is concerned primarily with bee diseases. Demonstrations on the first day will feature the research program of Iowa State College. A demonstration on the second day will feature laboratory diagnosis of bee diseases. A special called session of the Iowa Beekeepers Association will be held on Tuesday evening, May 10.

F. B. Paddock
Extension Apiarist

Michigan Annual
Ionia, July 15

The annual meeting of Michigan beekeepers will take place on Friday, July 15, at the Ionia Free Fair Grounds in Ionia, beginning at 10 a.m.

In addition to talks of interest to beginners and commercial beekeepers there will be a shooting demonstration by Sgt. Coykendall of the State Police; a demonstration of mechanical hive-lifters by Walter Kelley of Kentucky; choosing of the 1955 honey queen and granting of honorary life memberships in the Michigan Beekeepers Association.

A pot-luck lunch and supper will be held on the grounds and coffee and ice cream will be served by the Association. All who keep bees or are interested in beekeeping are welcome.

E. C. Martin,
Program Chairman

Los Angeles County Fair
September 16 - October 2
Pomona, California

Calling for a bigger, more comprehensive and more diversified exposition than ever, preparations are in full swing for the 1955 Los Angeles

County Fair, Southern California's greatest fall spectacle. Opening Friday, Sept. 16, it will continue for 17 days, through Sunday, Oct. 2. Last year's attendance reached 1,110,927. Expectations are for an even larger attendance this fall.

The 450-acre exposition park will be filled to overflowing with miles of exhibits—all new, all different—that they may more adequately reflect the growing and changing economy of the Southland in agriculture, industry and culture. No sooner had the gates closed on the last showing than activities were directed toward the tremendous undertaking required to stage this year's fair.

Special emphasis is being directed toward informative and educational phases calculated to make a visit more thoroughly worthwhile. Its enjoyment will be enhanced by spectacular entertainment. Grounds and improvements represent an investment of $20,000,000. Over 5000 people will be required to stage this event.

(Bee Business, Calif.)

Prayer by Wives of Beekeepers

Loving Father of us all
We, Thy children gather from many places in our beloved Country.
We Seek Thy Presence.
Thou, who through the ages has charted the course of the stars in the Heavens;
Causes the sun to shine that warms us and the seasons to come.
Thou, that makes every flower to bloom,
And directs each tiny bee to its source of honey.

We, Thy children, —in all humility—
Feel the daily need to be part of Thy universe
Including the forgotten past and the future yet unborn.

We realize that before the dawn of recorded history
Thy earthly children were grateful to Thee for honey for food;
Now we are privileged to be part of this long chain of mankind
Who cooperate with Thy creatures and laws of Nature.
And as the sleeping earth awakens this springtime and new life stirs
We ask Thy especial blessing on those dear hands in our households
Who will work with the bees in accordance with Thy natural laws.

May we supply patience and loving cooperation.
Even as Thou art in every blossom, seed and harvest,
So be Thou in our hearts
Which Thou can'st fill with beauty, kindness, truth, understanding and love.

Then when the lengthening shadows come to our own day
May we find peace in Thee.
Amen.

(Invocation given by Mrs. Sherman R. Cook at the annual meeting of the Ladies Auxiliary of the American Beekeeping Federation on January 19 in Chicago.)

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LOOK IT OVER
YOU WILL LIKE IT
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Attention!
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Sacramento, Calif.

PALMETTO QUALITY QUEENS
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• $3.75 at all booksellers, or direct from **American Bee Journal.**

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AMERICAN BEE JOURNAL

Editorial

Is the Honey Industry Dragging Its Feet?

At the Chicago convention in January of this year, the Honey Packers and Dealers Association decided to put into effect a voluntary plan to levy one cent per 60-pound can of honey to be matched by one cent per can by the buyer, **providing two-thirds of their members by volume of honey agreed to enter into such an arrangement.** This plan had been fostered by the American Beekeeping Federation. The money would go to the National Honey Council to be used for honey promotion and perhaps other things of benefit to the entire honey industry.

This was one of the forward steps taken at the Chicago meetings which contributed greatly to the fine spirit of harmony and cooperation that existed there. And while we are aware that certain steps are being taken to bring this plan into operation for the 1955 honey crop, we wonder if this splendid plan for creating an industry fund with which a great deal of good could be done is getting off to the start it should. Are some feet in the industry dragging?

The American Bee Journal heartily endorses this plan as does the Federation. We urge dealers and packers of honey to support the plan. We urge honey producers everywhere to give it their fullest support and to urge their honey buyers to support it also.

Chester Freeman, the man who directed the Government's October honey promotion, in a talk at the Chicago convention, said that promotionwise the honey industry had arrived at a dangerous age. There is no standing still in the great food business. The memory of the consuming public is short. When you stop pushing a product, you are losing ground in the great food battle. Times are not difficult now for honey. The honey industry is in a situation which makes it doubly dangerous to let down.

By supporting the check-off plan —one cent a 60-pound can levied against the producer plus one cent a can on the part of the buyer—we can raise enough money to adequately promote the consumption and sale of honey. Through adequate honey promotion we can ensure ourselves that honey will move readily from store shelves and thus maintain an active and firmer market for Nature's finest sweet. There likely will be some hitchhikers; there always has been. But a good promotional program capably administered will gain support! Let's get the job done in 1955. If we are to stand on our own feet as an industry, this must be done.

April Freeze in Southern Areas

The Dadants assumed the publishing of the American Bee Journal in May of 1912—just about the time that first shipments of package bees were being tried. Needless to say, in the ensuing years there were many errors that tended to cause a rift between the package producer and advertiser and the buyer in the North. Added to that was the difficulty of operating due to limited means of transportation and mediocre roads to outyards. Delays were not only frequent; they were unavoidable. Many a time we interceded between producer and beekeeper over such delays.

But in recent years, the number of complaints due to delays have been remarkably small. Improved methods and better business knowledge combined with better means of transportation, better help and equipment; all have helped.

But this year another unavoidable circumstance presented itself to the shippers in the form of a serious weather handicap. Just when colonies were growing to shaking strength, just when nuclei had been started, and just when cells were ripening for introduction to the nucs, there came a spell of "rough" weather. Temperatures of ten, fifteen, and twenty degrees were registered clear into the deep South. Tender buds and blossoms were caught just when bees were depending on the plentiful

pollen and nectar supply. It took quick action on the par' of the package shipper and queen breeder to soften the blow. He had to throw his resources into a feeding program and abandon for the moment his breeding program.

We may well commend the shippers that they were able to recover from such a reversal as well as they did, and not be surprised that there were a number of delays and disappointments this year—when the northern producer likewise had unexpected and disappointing losses, and hurried to order packages to make up his original number of colonies.

Cut Down the Super Stack . . .

To keep hives from becoming too high with supers, the food chambers of the colonies may be stored above weak colonies or set off on a separate stand if they have any young brood, and allowed to rear a queen. In the fall after supers have been removed for extracting, the food chambers may be replaced.

Julius Lysne, Wisconsin

Package Bees Queens

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Extra Queens, 85c each.

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1-24	$1.10	$3.50	$4.50
25-99	1.00	3.25	4.25
100	.95	3.00	4.00

(Last month our advertisement got mixed up—these are our actual selling prices—they are net—no discounts.)

WALTER T. KELLEY CO., Clarkson, Kentucky

The Market Place . . .

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CAUCASIANS — Very hardy, gentle, long lived, good workers. Personally raised, select untested queens $1.10, any number. Fred Brock, McDonald, Tenn.

100 ten-frame colonies. Booster bees 60c pound after May fifteenth, you supply cages. A. V. Dowling, Valdosta, Ga.

AVAILABLE JUNE 1st, the best queens money can buy. $1.00 each. Milton Stricker, R.D. 1, Annandale, N. J.

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ITALIANS—Packages, queens. Martz, Rt. A2, Box 846, Vacaville, Calif.

CAUCASIAN BEES and QUEENS — Real workers and very gentle. Select untested queens, 1 to 25, $1.20; 25 to 100, $1.10; 100 up, $1.00. Package bees—2-lb. package with queen, $3.50; 3-lb. with queen, $4.50. Health certificate with every order. Black River Apiaries, Currie, N. C.

LIGHT 3-BAND Italian bees and queens—3 pounds with queen, $4.70; 5 pounds, $6.70. Shipped prepaid. Queens, $1.00. Luther Pickett, Efland, N. C.

GOLDEN ITALIAN bees and queens—Real beautiful and very gentle. Untested queens, 1 to 25, $1.20; 25 to 100, $1.10; 100 up, $1.00 each. 2-lb. package with queen, $3.50; 3-lb. with queen, $4.50. Satisfaction guaranteed. Carolina Bee Farm, Graham, N. C.

FOR SALE

450 COLONIES, equipment partly made for 500. Large rockfaced cement block shop. Modern equipment. Locations. No disease. Truck. Livable cabin. This is a very good going business in excellent condition. Substantial down payment. Wilburt A. Walker, Port Austin, Mich.

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COMPLETE BEE EQUIPMENT. Inspected. Elmer Beaumont, Route 1, Helenville, Wis.

100 10-frame colonies with excluder and shallow super. Excellent condition. $10 each. Osceola Honey Farms, Elizabeth City, N. C.

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Herb Light, Box 77, Colusa	Calif.
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A. F. Miller, P. O. Box 54, Williams	Calif.
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Three Banded Italians. Two good races—
Our regular strain and Dadant's Starline Hybrids.
Real honey getters and easy to work with.

Regular Italians		Starlines	
1 to 25	$1.20	1 to 25	$1.50
25 to 100	1.10	25 to 100	1.40
100 up	1.00	100 up	1.30

Package Bees—2-lb. with queen, $3.50 — 3-lb. with queen, $4.50

Add 30c to each package for Starline queens with package.
All packages shipped from Graham, North Carolina

ALAMANCE BEE CO. — **Phone 4703, Graham, N. C.**

Better Bred Queens — Three Banded Italians

The bad weather over, let us fill up that empty equipment with our Better Bred Stock. Don't let those failing queens rob your profits. Good queens will pay off.

Let us supply your needs at the following prices:

	2-lb. w/q	3-lb. w/q
1 to 18	$3.25	$4.15
18 to 99	3.10	4.05
99 or more	3.00	4.00

Queens, any quantity 75c each. After May 15th, 65c each.
25c per package less after May 10th.

CALVERT APIARIES

CALVERT, ALABAMA

Quality Light Italian Queens, Each 85c

2-lb. Package Bees with Queen ..... $2.75 exp.
3-lb. Package Bees with Queen 3.50
Additional lb. 75c

Delivered on quantity orders, 1200 miles or less at small additional charges.

B. A. ANDERSON CO. — **Opp, Ala.**

YELLOW ITALIAN BEES AND QUEENS

Do you want heavy producing stock, beautiful bees, young vigorous queens—stop searching—we have 'em. Our prices are:

2-lb. pkg. with queen, $2.50; 3-lb. pkg. with queen, $3.50; 4-lb. pkg. with queen, $4.30
Queens, 85c each airmail. Health certificate, live arrival guaranteed.

JOHNNIE ARNOUVILLE — Route 106, Hamburg, La.

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Has Been Connected With the Honey Business Since
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Package Bees & Queens
Write for Prices
Gene W. Stiles
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Italian Queens 75c Each
Air Mail and Guaranteed to Please
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Box 193 — Coffee Springs, Ala.

HONEY WANTED
Carloads or less than carloads. Quote best cash price delivered to us. All grades; send samples.
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2721 West Roosevelt Road
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Large Leather-Colored Three-Banded
QUALITY SUPREME
Certificate with each shipment
1-9 Air Mail ..... $1.00 Each
10-99 Air Mail ..... .95 Each
100 Up Air Mail ..... .90 Each
DR. WILLIAMS APIARIES
115 W. Sterling St. — Baytown, Texas

Select — Italians
QUEENS
Package Bees
M. C. WEST
Route 1, Box 279-A
Winters, California

ITALIAN QUEENS
$1.20, Each (up to 51)
In larger lots, write for prices.
Queens raised from heavy-producing stock.
BEES—2-lbs.—$3.50
3-lbs.—$4.50
Health Certificate.
What have you to trade?
Homer W. Richard
1411 Champagnolle St., El Dorado, Ark.

GOOD ITALIANS
$1.00 Each
WHITE PINE BEE FARMS
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CROPS and MARKETS

by M. G. Dadant

Wintering Results

Throughout most of the country we can say that the under par condition of bees coming out of winter quarters was largely due to the fact that the fall of 1954 was devoid of the usual crop of fall honey so that colonies raised fewer young bees for winter and went into winter with fewer stores of honey. Added to this was the prolonged cold weather without flight in many northern sections which took its toll of bees. Colonies wintered better in central and southern sections than in the extreme North.

Condition of Bees, April 20

Southern bees built up rapidly and looked in excellent condition until the bad freeze in early April which killed all bloom, even killing some of the brood in colonies. In other areas, losses from winter have ranged from 5 per cent to as much as 25 or 30 per cent, but where bees are being fed promptly conditions have nearly approached normal and we would judge that of the remaining colonies wintered, most are probably 100 per cent efficient.

Package bee and queen producers have been hard put to fill the demand for packages and queens to restore normal numbers of colonies. Their difficulty was enhanced by the fact that just at the time their colonies were building into proper condition for packages, the cold spell put a definite crimp on the growth of the colonies. Many package shippers have had to hunt everywhere they could for bees to fill their promised orders.

Honey Plants

In this department conditions are much better. Outside of the heavy freeze in the southern areas, it is our estimation that honey plants this year are in better than normal condition and may partly make up for the under par condition of bees.

The southern areas have suffered from drought, but rains in mid-April apparently have made up some of the deficit in top soil, at this date there are possibilities that the gallberry may throw out new shoots, and there is hope, not only for a normal bloom, but perhaps extra staggered bloom on account of the freeze. There has been little heaving of clover in northern areas, acreages of legumes appear to be up to last year, and even the difficulties in the Hubam clover regions, where the late freeze did great damage, seem to be ameliorating from a desire on the part of farmers to replant anticipated acreages. There seems to have been sufficient moisture last fall to start vetch planting and its growth now seems satisfactory, as does the crimson clover of the central South. While large acreages, no doubt, are being reduced in California owing to encroachment of city building, yet orange conditions look satisfactory for a fair crop. The Texas citrus crop was a failure, but in Florida was apparently about normal or a little less than a year ago. The Arizona citrus crop was apparently late.

Moisture

Although recent rains have provided ample moisture for surface conditions, subsoil moisture is still insufficient so that normal or more than normal rains throughout the late spring and summer will be needed. Those in the western plains region have better conditions but dust storms are still a danger in eastern Colorado, Nebraska, Oklahoma and into West Texas and New Mexico. In California, moisture is satisfactory for irrigation and for the northern coastal area, but is lacking in the desert areas so that not much can be expected from the desert flowers.

In Canada, conditions seem more ideal than in any other section of the continent. Moisture has been sufficient, bees apparently have wintered well, and honey plants are satisfactory.

Increase

Judging from conditions of bees, most sections will do well to make up the losses of winter without anticipating a great amount of increase. In the Canadian provinces, however, there apparently is a definite desire for increase during the 1955 season, due to the shortage of honey and the necessity of buying cars of U. S. honey to fill the demand.

Honey Wanted—Cars and less than car. Top Prices.
C. W. Aeppler Co., Oconomowoc, Wis.

Standard Works . . . New Titles

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With fifteen other authors. Standard for the beekeeping world. 650 pages.

QUEEN REARING — Laidlaw & Eckert . . . 2.50
For all uses, beginner or professional. 160 pages.

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An encyclopedia of flowers. 460 pages.

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Authority on comb-honey production. 130 pages.

FIRST LESSONS IN BEEKEEPING — Dadant. 127 pages . . . 1.00

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American Bee Journal
Hamilton, Illinois

Starline SUNKIST Italians

Reg. U.S. Pat. Off.

May is the time to get those heavy packages with a strong, vigorous SUNKIST reared queen. May packages are available now. To insure your crop we urge you to go to STARLINE HYBRIDS, for their record of performance is above average.

Our regular Italians are the results of years of selection.

Prices, packages with Italian queen—

	Italian Q.	Starline Q.	2-lb. w/q	3-lb. w/q	4-lb. w/q
1-24	$1.20	$1.50	$3.50	$4.40	$5.30
25-99	1.10	1.40	3.25	4.15	5.05
100-up	1.00	1.30	3.00	3.80	4.80

Packages with Starline queens add 25c per package.

SUNKIST BEE CO. **Convent, La.**

Telephone: Lutcher 2645

DARK ITALIAN QUEENS

As Good as the Best

1 to 10	$1.20
11 to 50	1.10
51 and up	1.05

Quality and Service

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BARREL HOOKS

With one set of hooks, such as we list, you can lift up a barrel in either a horizontal or a vertical position. If you are turning to barrels, see our catalog for barrel trucks and other special items.

We have special items for the small beekeeper also. A big 64-page catalog lists many items not found in the other catalogs. We manufacture bee hives, bee comb foundation, extractors, tanks, special hand trucks, hive loaders, etc. Our prices are always lower and we ship your order the same day as received. Write today for our big free 64-page catalog.

WALTER T. KELLEY CO. **Clarkson, Ky.**

— ITALIAN —

Package Bees and Queens for 1955

	1-11	15 or More
2-lb. pkg. with Queen	$3.25 each	$3.00 each
3-lb. pkg. with Queen	4.25 each	4.00 each

Live delivery guaranteed.

GIRARDEAU APIARIES **Tifton, Ga.**

HARPER'S FAMOUS

High Quality Italian Queens and Package Bees

Prices after May 5th

2-lbs. w/q	3-lbs. w/q	4-lbs. w/q
$3.15	$4.00	$5.00

QUEENS, 85c each. 10 & Up, 75c each.

All queens sent Air Mail.

Bees are very prolific and extra good honey gatherers.

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Leak-Proof DeLuxe Model Priced at $2.10
Plus Shipping fee on 2 lbs., 11 oz.

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Italian Queens

1 to 9	$1.25 each
10 to 24	1.10 each
25 or more	1.00 each

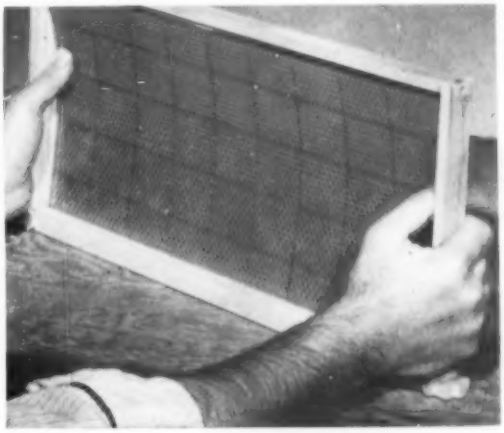
John S. Shackelford

Rio Oso, Calif.

Dadant's Gilt Edge Foundation

Gilt 4-Edge

Just fit together a Lewis Nailless Topbar frame, then set one of the long Gilt edges of a sheet of Dadant's Gilt 4-Edge foundation into the groove of the inverted topbar. Then fit the bottombar of the frame over the other long edge of the foundation and nail the ends of the bottombar into the side bar recesses using the nail holes already pierced for it. Simple, isn't it? And it takes only a minute of time.



A Magic Combination

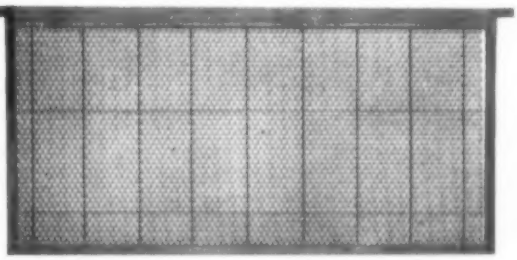
When you use the new Lewis Nailless Topbar Frame, you can assemble frame and foundation in less than a minute. There are only two nails to use; no frame wiring to do; no embedding to do.

Gilt 3-Edge

Three metal edges, one on each side and one on the bottom with the familiar crimp-wired hooks along the top edge. With a slotted (or two piece) bottombar, slip the long metal edge of the foundation into the slot of the bottombar; then nail the frame wedge under the hooks of the top edge of the foundation. There is no wiring to do as the wires are all in the foundation, saving you hours of time.

Dadant's Crimp-wired Foundation

Dadant's Crimp-wired Foundation makes everlasting combs. Each crimp in each wire exerts a steady pull to keep the pure beeswax sheet in exact center. The wires are specially shaped and embedded for the exact needs of perfect combs. They are of special steel so they do not bend out of shape and the hooks hold any weight the combs can put on them.

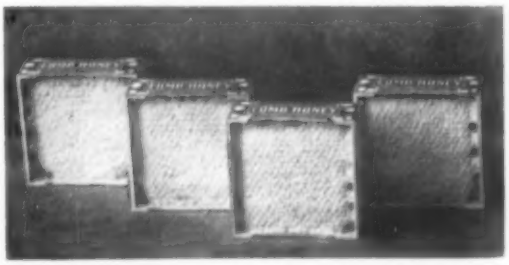


Gives you combs as permanent as your hives; produces combs of full worker cells that make larger colonies, greater crops, more profit. Hundreds of thousands of these fine combs have been in use twenty or thirty years. Such combs will cost you less and last a lifetime. Two horizontal wires put in by hand will hold foundation at center.

Dadant's Surplus Foundation

Section Comb Honey

Dadant's Thin Super Foundation is so thin and clear you can see through it. It will give you quality section comb honey. The biting quality at the base of the honey is such that the wax crumbles under the tongue; delicate, tasty, downright good.



Cut Comb Honey

Honey markets want honey, cut from the combs and put in cellophane wrappers in cartons, or packed in glass with liquid honey. You must have shallow super combs with honey having a fine finish. Either Dadant's Thin Surplus or Cut Comb Foundation will produce just the kind of honey you want for this purpose.

DADANT'S PLAIN FOUNDATION—Without wires, for those who have their own way of assembling and wiring foundation. Made by Dadants for over seventy-five years. Each sheet inspected; packed in tissue, in tight-fitting cartons.

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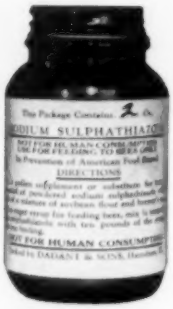

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